

10th Anniversary Machine & Tool Progress Issue

*The*

MARCH 1942

# TOOL ENGINEER

MACHINERY

• PRODUCTION

• TOOLS



**Victory is a MANUFACTURED product**

THE vastly increased number of New Britain Automatics being built for American industries will turn out millions of parts in thousands of shapes, forms and sizes. Each will play its part in the making of single "end product" and that product will be victory, final and complete.

**NEW BRITAIN • GRIDLEY**

Machine Division • The New Britain  
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*Official Publication of the American Society of Tool Engineers*

**He depends on the precision in  
Pratt & Whitney Bench Lathes**



**T**HIS man is making small precision parts that will assemble into fine measuring instruments important to defense work. Speed is necessary . . . but no sacrifice of accuracy can be permitted. The Pratt & Whitney Precision Bench Lathe is doing the job . . . doing it 24 hours a day.

These small machines are tough, rigid and accurate. They need only a little shop space because of their compact under-the-bench motor drives. They release larger lathes for the bigger jobs, but they will handle a surprisingly wide range of work.

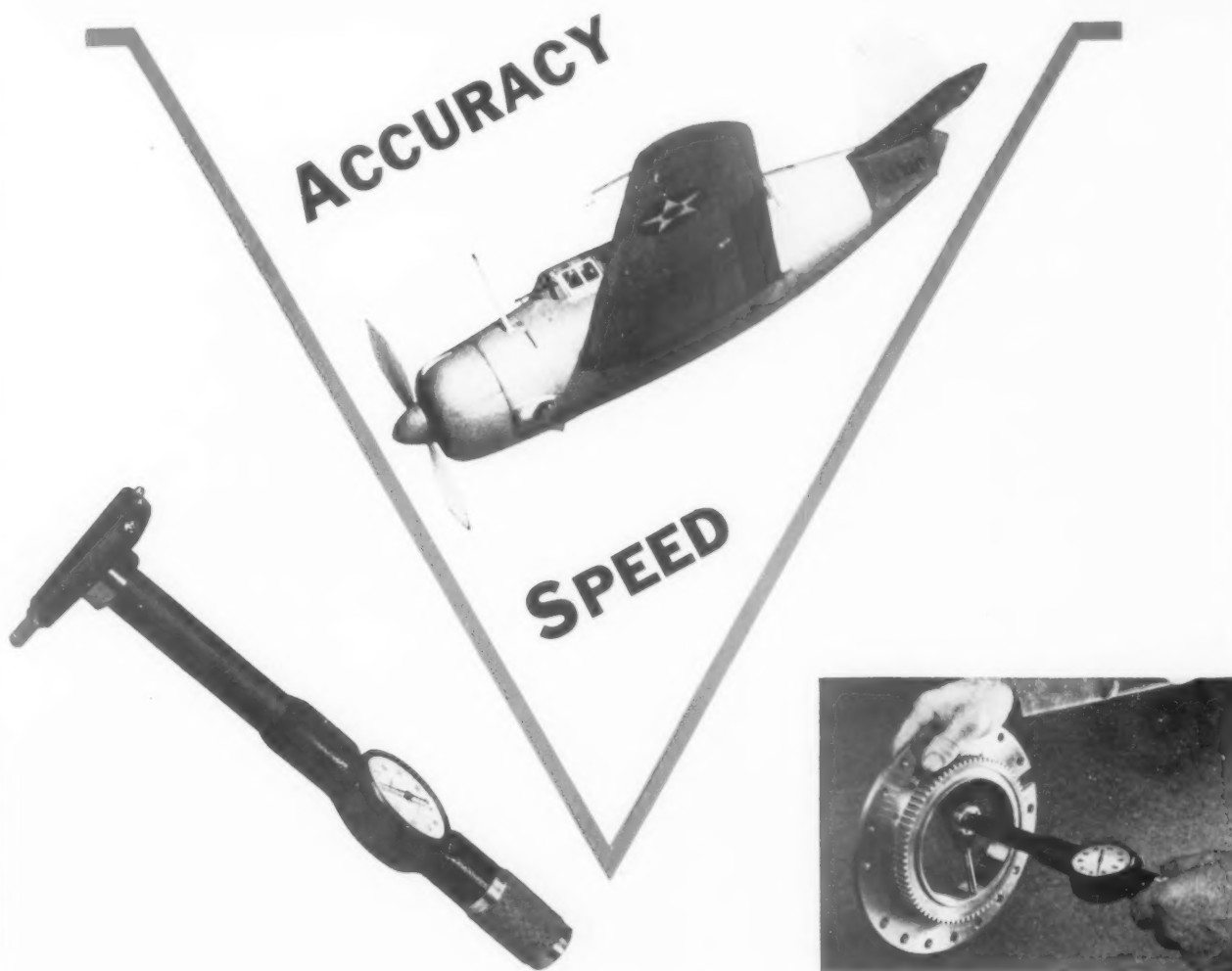
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**ACCURACY and SPEED** are vital factors wherever our armed forces strike at the enemy.

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**ACCURACY and SPEED** in checking bores with close tolerances is now a reality.

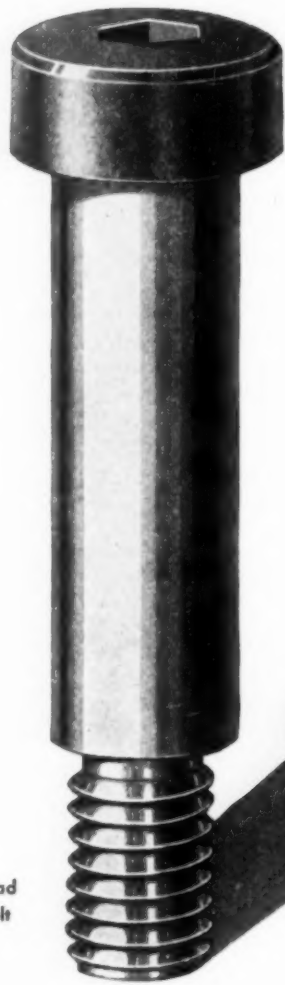
Standard Dial Bore Gages check bores to .0001" limits instantly with one simple operation.

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Stripper Bolt



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# THE TOOL ENGINEER

Volume XI

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Number 3

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MEET "GREENIE"

She's a great gal. We know you'll like her. There is lots to her. As the draft draws the boys out it will draw new girls like "Greenie" into the shop. In this issue of THE TOOL ENGINEER we introduce "Greenie", the new shop girl. You will want to follow her trials and tribulations. You may have a "Greenie" in your shop. If you have any laughs on her let us know. We may be able to pass them along.

Member



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National Business Papers Assn.

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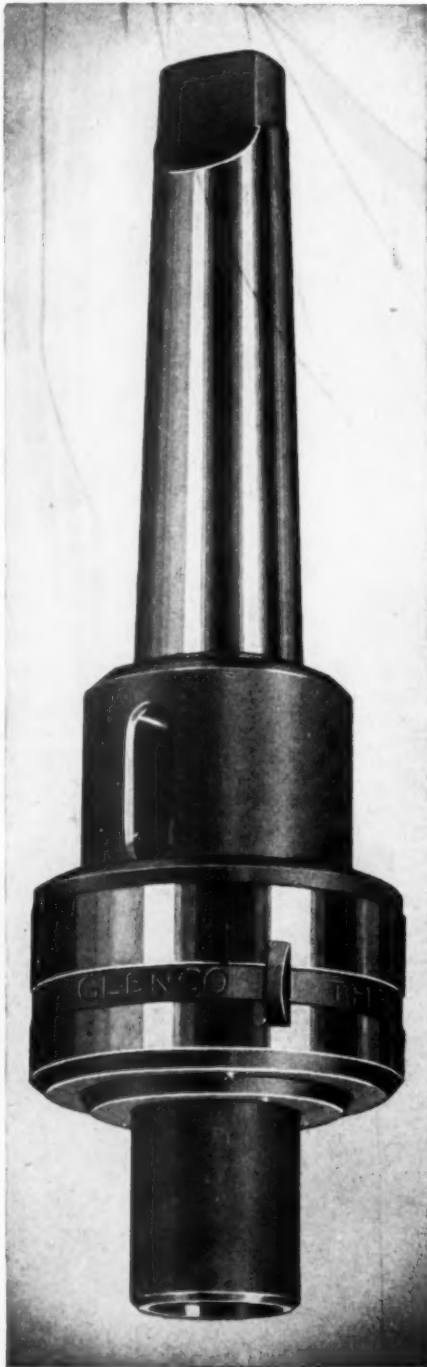
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**THE TOOL ENGINEER**



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America's Industrial Man-Power.

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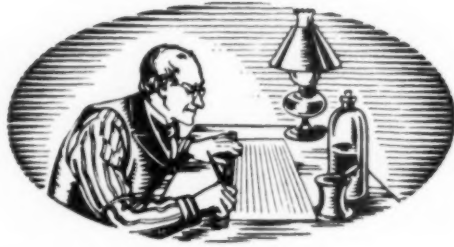


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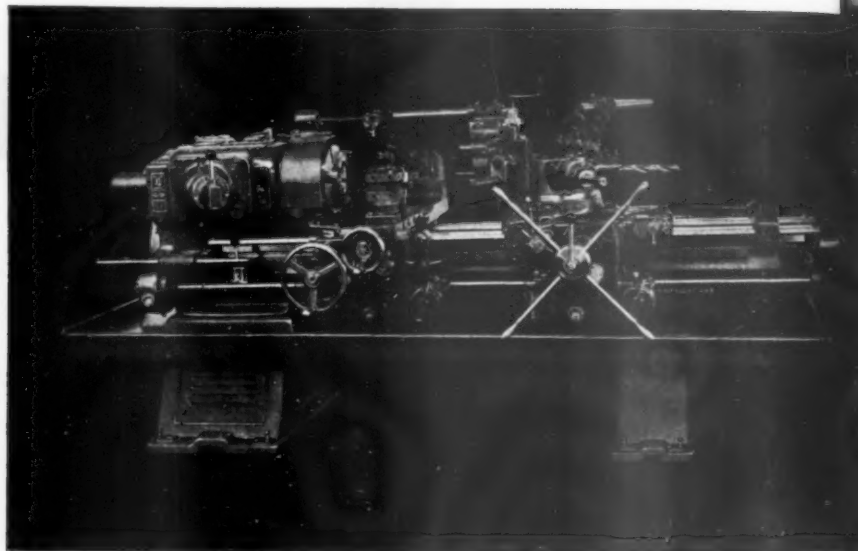
*Milwaukee*  
MILLING MACHINES

*Milwaukee* **M I L L I N G M A C H I N E S**

# LEMUEL HEDGE

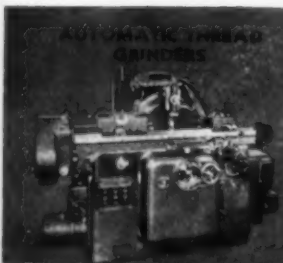


**U**NTIL 1818, sheets and blank books had been lined by hand, but in that year Lemuel Hedge built the first machine for ruling paper. The same principles are still used in modern ruling machines. By replacing handwork with sound mechanical means for controlling both tool and work, this early Vermont machine builder cut the cost of this operation by 75%. This is another instance where the direct predecessors of Jones & Lamson performed an outstanding service to industry.



No. 7A Jones & Lamson Saddle Type Universal Turret Lathe with standard chucking equipment.

## JONES & LAMSON



AUTOMATIC THREAD GRINDERS



OPTICAL COMPARATORS



RAM TYPE UNIVERSAL TURRET LATHE



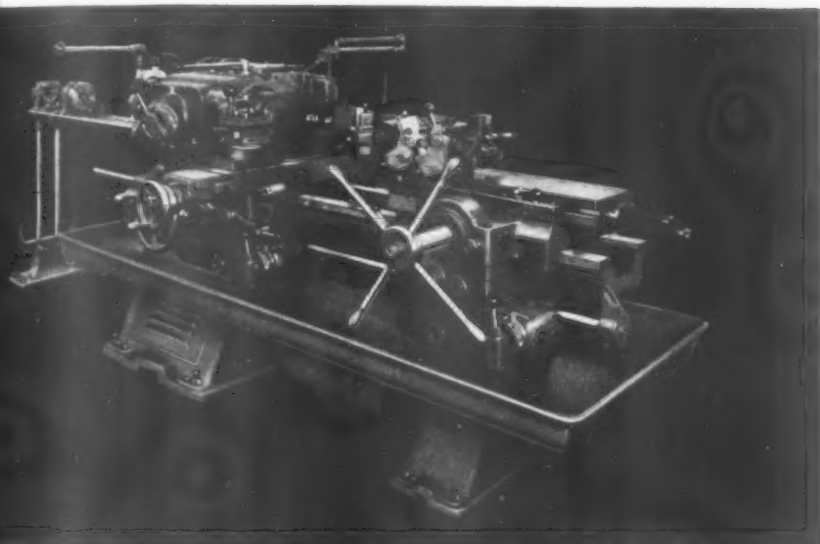
# is still cutting costs for you!

**M**ost of the machines built by Lemuel Hedge have long been obsolete. Obsolete also are the pioneer models of Vermont men who followed Hedge — men like Hubbard, Robbins, Lawrence, Howe and Hartness. Yet their original designs survive today, to cut costs for you, in modern Jones & Lamson Machine Tools — improved, advanced and speeded up through ceaseless development by present day Jones & Lamson engineers.

Because of these improvements, every modern Jones & Lamson machine embodies

exceptional reserves of speed, rigidity and useful power. With these modern machines you can take *full* advantage of the hard alloy cutting tools now available *or in prospect*. With these machines you can meet the present demand for wartime production and still be ready to compete successfully for postwar business.

To deal with today's emergency and protect your future needs, put your production problems up to Jones & Lamson engineers. Inquiries from large companies or small receive prompt attention here.



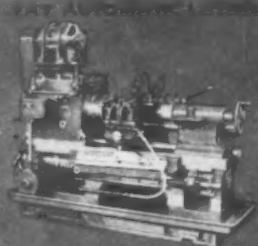
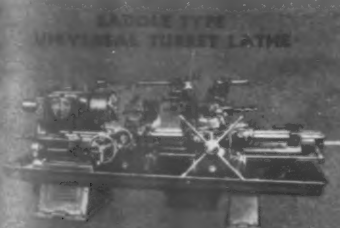
No. 3 Jones & Lamson Ram Type Universal Turret Lathe  
with standard bar equipment.

**MACHINE COMPANY**  
**SPRINGFIELD, VERMONT, U. S. A.**

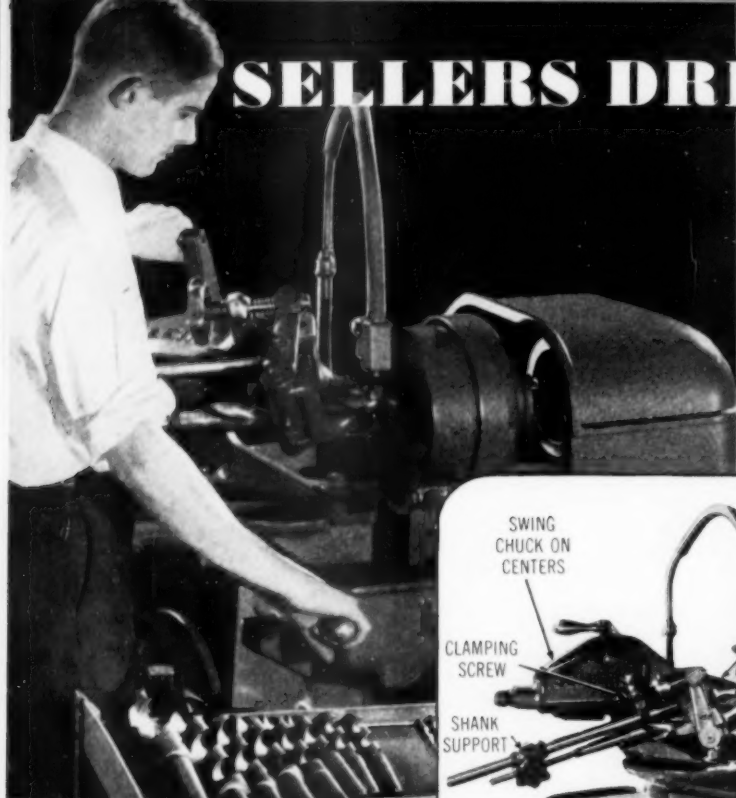
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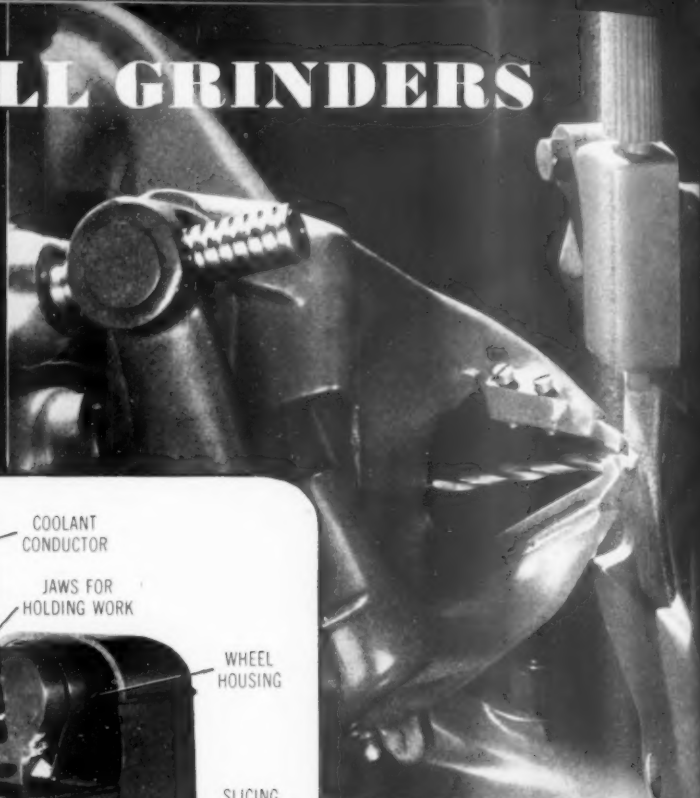
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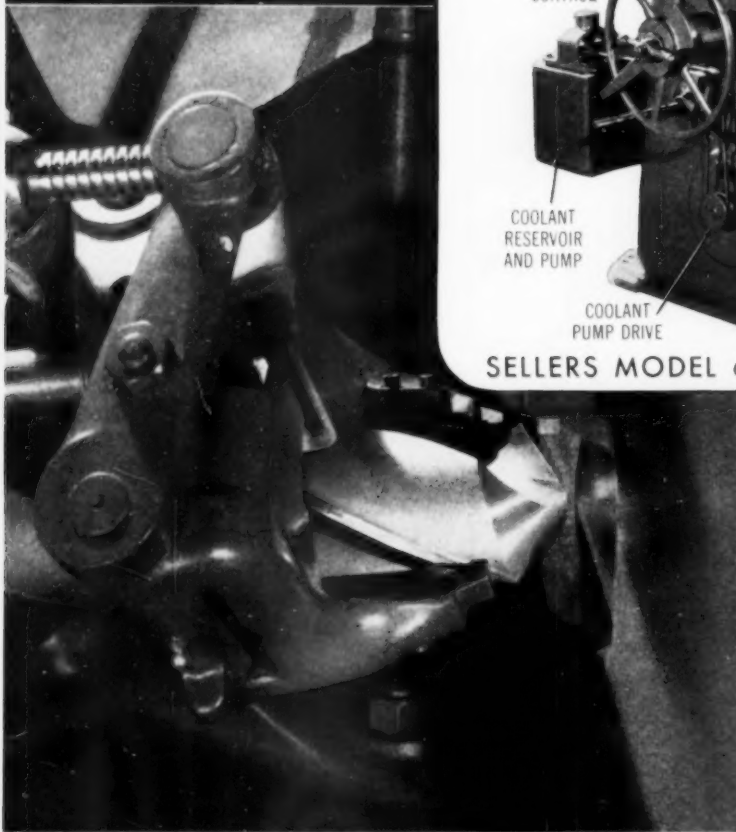
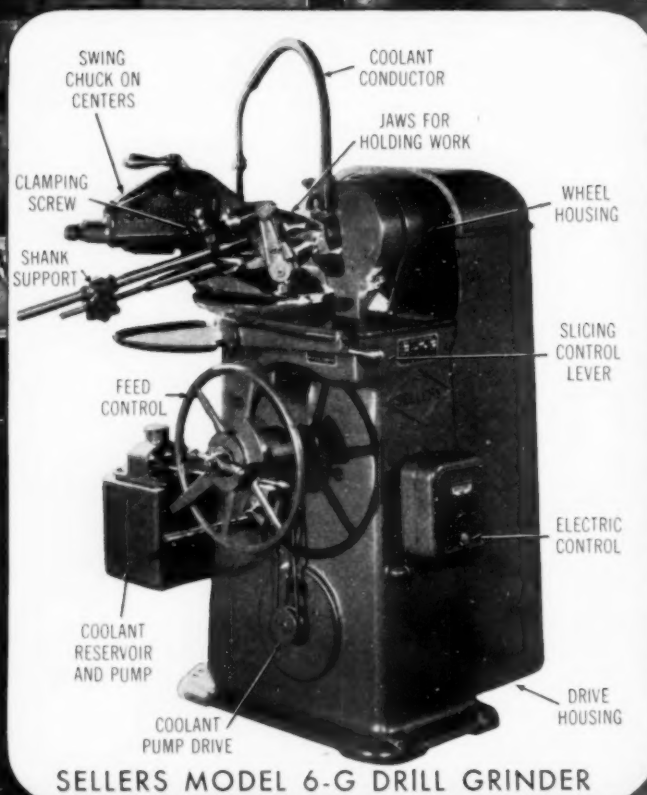
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**EASY TO OPERATE**



**GRINDS DRILLS  
AS SMALL AS 1/4"**



**GRINDS DRILLS AS LARGE AS 3"**



**RECLAIMS BURNED AND BROKEN DRILLS**

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# Sellers

# 45 Bayonets PER HOUR DRILLED and REAMED on this NATCO

• The NATCO illustrated here is being used by an Arms manufacturer for drilling and reaming the hole in the mounting end of bayonets. A total of five operations are performed on 45 bayonets per hour.

• This machine is a Model B-4B NATCO HOLESTEEL arranged with a head containing 10 anti-friction bearing mounted spindles, of which two have micro adjusting nuts.

• Mounted upon the six position rotating table is a six position fixture arranged to hold two bayonets in each position while the operations are being performed.

• Regardless of whether you manufacture tanks, guns, aircraft engines, radios, typewriters or motors, there is a NATCO of correct size and type to fit your particular requirements. Take advantage of NATCO machines to reduce drilling, boring and tapping costs.

• NATCO HOLESTEEL machines are built in a variety of sizes and capacities, and are sturdily engineered to stand up against hard usage over long periods with little maintenance expense. Write for literature or call a NATCO representative. No obligation.



**THE NATIONAL AUTOMATIC TOOL COMPANY**

Richmond, Indiana, U. S. A.

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*NATCO Advanced Engineering  
Plus Quality Construction  
Recognized For Many Years  
The World Over*

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NATCO HOLESTEEL  
Vertical Machines

**Investigate  
NATCO Methods for  
the Lowest Possible  
Hole Costs!**

**NATCO**  
**DRILLING, BORING and TAPPING MACHINES**  
*S***OLVES YOUR "HOLE" PROBLEM**

# *This Distributor is organized to give "Sudden Service"— and So is Yours!*



Just suppose that:—

1. Some time around 1 a.m., your night crew had ruined steel cutters that you couldn't replace—then failed to report the damage; and suppose:



2. Your day shift waited till 9:45 before discovering and reporting the loss to your Plant Superintendent—



3. Would you leave it to your own people to find replacements or—



4. Would you call in your Assistants-at-Large—the alert, capable, resourceful men of your Mill Supply Distributors' staff—and ask for a big helping of their "sudden service"?

Well—that's the *start* of a "short short" true story—the clocks tell the rest!

First the Distributor blanketed his area with long-distance calls. In a few minutes he located cutters at another manufacturer's, 41 miles away, who was willing to "loan" them. The Distributor found one of his own salesmen in that same City and directed him to pick up the cutters and start a "Paul Revere" back toward home.

Then the Distributor, still ticking, started one of his own men out to meet the salesman. Just half way they made a quick swap and the cutters were delivered to the waiting plant at

11:15—*exactly 82 miles and 75 minutes from the time they were first located by the Distributor!*

We, too, are doing our best through fast-thinking Distributors like this one, to keep you supplied with enough Cle-Forge High-Speed Drills and Peerless High-Speed Reamers so you can maintain full production throughout the emergency.

Resourceful Jobbers nationwide have always done their big part to keep you supplied with vital materials out of their own stock when you needed them most. These men are working in *your* best interest today, and in *ours*, as sole Distributors of "Cleveland" Tools.

This incident is typical of the unusual services that many Mill Supply Distributors are rendering their customers during the Emergency.

The **CLEVELAND** TWIST DRILL COMPANY  
1242 EAST 49<sup>th</sup> STREET  
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"CLEVELAND" DISTRIBUTORS EVERYWHERE ARE READY TO SERVE YOU

# Results

## FROM PLANNED PRODUCTION

### ON A

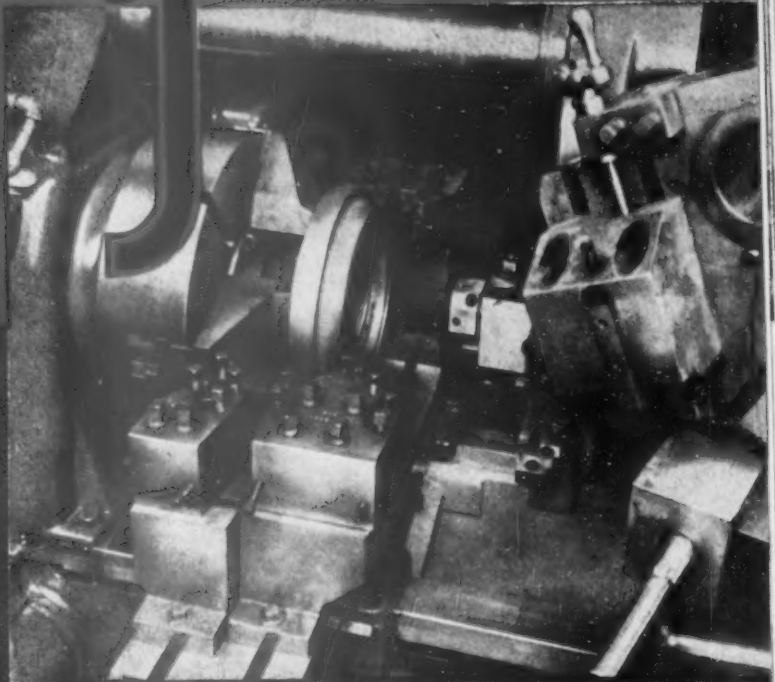
### 5 DE POWERFLEX

#### DETAILS OF JOB

Part: Tractor Flywheel  
Material: Gray Iron

#### Operations:

- 1st T.F.: Rough bore hole; rough bore 8.030" dia.; rough face web; rough machin 9.180" dia.; O'hole; rough turn O.D.; form turn 12.000" dia.; face both sides of rim; face shoulder; face 10 1/2" dia.
- 2nd T.F.: Finish bore hole; bore 8.030" dia.; face web; bore 9.180" dia.; face both sides of rim; face shoulder; face 10 1/2" dia.; form turn 12.000" dia.; break corners.
- 3rd T.F.: Finish face 9.180" dia.
- 4th T.F.: Room hole 1.850" dia.
- 5th T.F.: She turn 12.000" dia.; she bore 9.181" dia.



**\* A TRACTOR FLYWHEEL  
EVERY 5.81 MINUTES**

possible to perform most of the operations in one holding of the work.

Operation and quick adjustment are such as to reduce changeover time and make possible low cost production of comparatively small lots of flywheels.

Both machine and tooling are designed for maximum rigidity and minimum vibration using tungsten carbide tools operating at maximum feeds and speeds.

**T**HIS P&J machine is required to produce flywheels of a number of different types. P&J engineers carefully considered the necessity for rigid tooling under high production demands as well as tool life and quick change from job to job. Gripping of the part on the hub makes it

# POTTER & JOHNSTON MACHINE CO.

PAWTUCKET,

RHODE ISLAND

# ... GET INTO TODAY'S PICTURE!



**P**RECISION GRINDING of threads—either from the hardened solid material or on pre-cut threaded work after heat treat—is in fast increasing demand. The speedy production and repeated accuracy that precision thread grinding assures are becoming absolute requirements in the machining of many metal parts urgently needed today for war purposes.

Eight standard styles of precision thread grinders are made by Ex-Cell-O Corporation, original designers and manufacturers in the United States of precision thread grinders for commercial use.

**EX-CELL-O CORPORATION • DETROIT, MICH.**

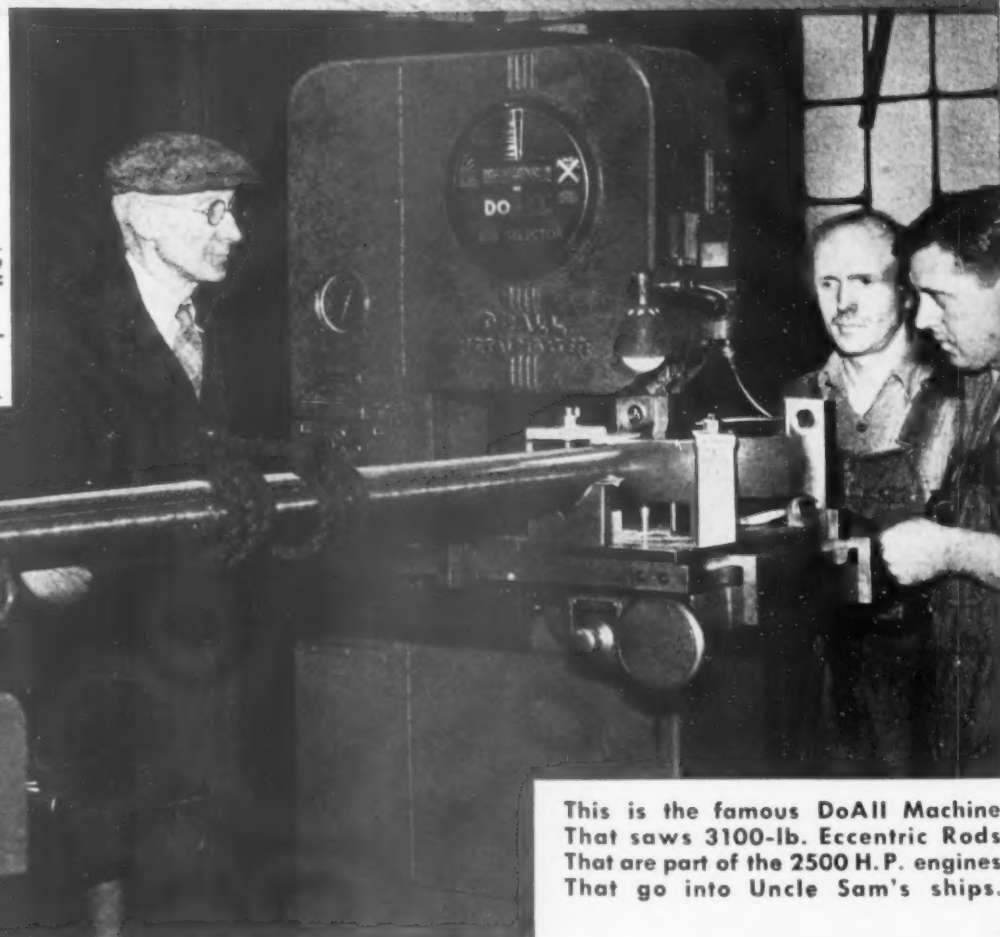


★ EX-CELL-O MEANS PRECISION ★

THREAD GRINDING, BORING AND LAPPING MACHINES • TOOL GRINDERS • HYDRAULIC POWER UNITS • GRINDING SPINDLES • BROACHES • CUTTING TOOLS • DRILL JIG BUSHINGS • DIESEL FUEL INJECTION EQUIPMENT • R. R. PINS AND BUSHINGS • PRECISION PARTS

# DoAll SPEEDS PRODUCTION

DOWN TO THE  
SEA IN SHIPS



This is the famous DoAll Machine  
That saws 3100-lb. Eccentric Rods  
That are part of the 2500 H.P. engines  
That go into Uncle Sam's ships.

## 7 HOURS' WORK IN 1 HOUR

At Filer & Stowell Co., Milwaukee, Wis. this Connecting Rod formerly took 7 hours to machine by boring and slotting. Now DoAll does the same work in 1 hour, and the slotter and boring mill are released for other work.

The DoAll sets new production records. Takes the place of shaper, milling and lathe work on hundreds of operations. Priced from \$1,000 to \$5,000 complete with necessary equipment. Worth its weight in gold — Investigate the DoAll at once.

*Let us send a factory-trained man to your plant with  
a DoAll to show you what it can do and save for you.*

## CONTINENTAL MACHINES, INC.

1304 S. Washington Ave. Minneapolis, Minn.

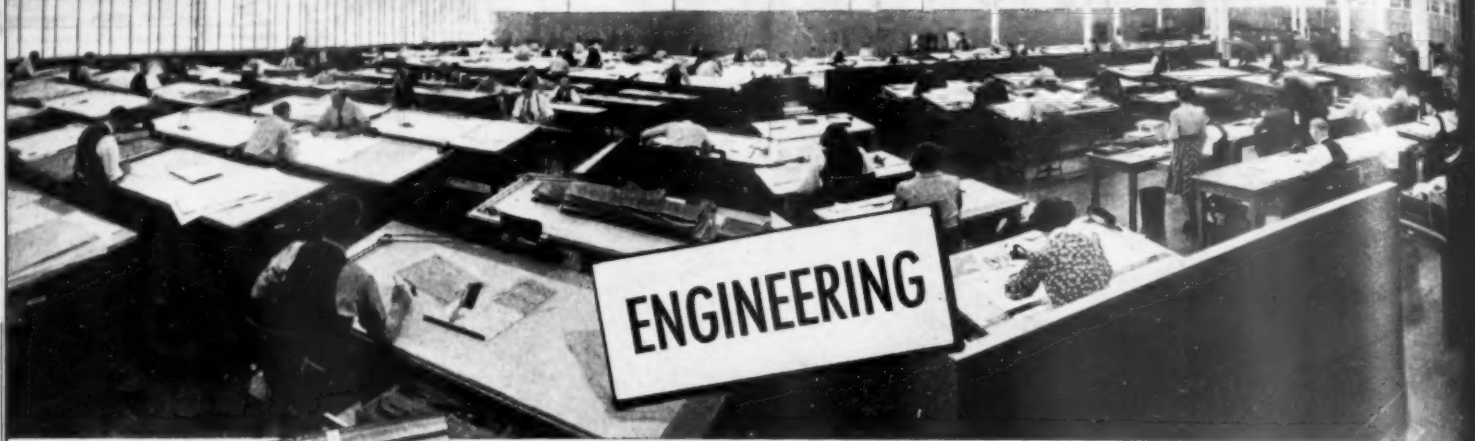
Associated with the DoAll Company, Des Plaines, Ill. Manufacturers of Band Saws and Band Files for DoAll Contour Machines.



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Fastest  
Precision  
Method of  
Removing  
Metal

NEW  
Interesting and  
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"Do All on  
Production" free  
on request.

**What we have offered for years  
is more necessary than ever today**



Only winning the war counts today, therefore, your problems are our problems and our 200 engineers with years of experience and innumerable records are yours for the asking. Let's get them together wherever there is work of precision finishing.



Every day counts and our assembly line never stops. Every machine and nearly every desk in the entire plant are in operation 24 hours 7 days a week. Deliveries are as prompt as priorities will permit.

Heald machines arrive ready to run. Our demonstrators are on the spot to set them up and furnish prompt instructions for operation, or before the equipment arrives the customer is privileged to send his men to our plant where a special training school will provide just the information that the operators require.

It's an "all out" co-operation so why not take advantage of our experience and manufacturing facilities.

**SERVICE**

• Precision Internal  
and Surface Grinding  
Precision Boring,  
Facing or Turning



**The HEALD MACHINE COMPANY, WORCESTER, MASS.**

# DoAll SPEEDS PRODUCTION

OVER THE SEA  
IN PLANES



This is the famous DoAll Machine  
That cuts the corners—saves much time  
That's needed in making metal parts  
That go into Uncle Sam's fighting planes.

## DoAll and the THUNDERBOLT

Views on this page are taken at one of the Republic Aviation Corporation's plants, where the sensational new **Thunderbolt** is being made. Dozens of DoAlls are sounding the all-clear-ahead signal by shaping and finishing parts in a fraction of former time.

Every plant where man-hour and man-energy savings are essential needs the DoAll. Every metal worker instantly recognizes the value of this modern production tool.

DoAlls range in price from \$1,000 to \$5,000 complete with necessary equipment; yet are relieving \$10,000 to \$50,000 machine tools of over-load work with valuable savings of time and metal.

★Fastest Precision  
Method of  
Removing Metal

Let us send a factory-trained man to your plant with a DoAll to show you what it can do and save for you.

NEW—Interesting and valuable book  
"DoAll on Production" free on request



## CONTINENTAL MACHINES, INC.

1304 S. Washington Ave.

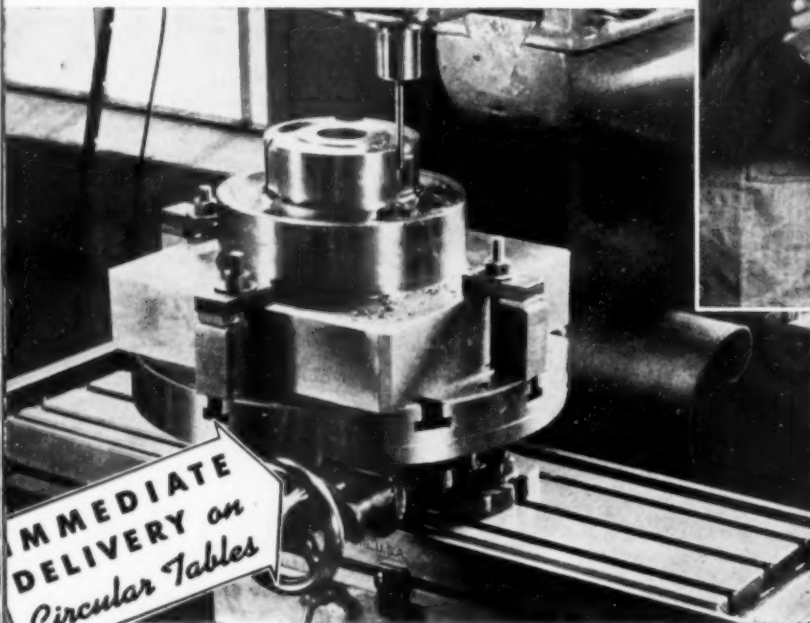
Minneapolis, Minn.

Associated with the DoAll Company, Des Plaines, Ill., Manufacturers of Band Saws and Band Files for DoAll Contour Machines.



# HOW **GORTON** *Super-Speed* MILLER

**SAVES TIME  
ON HIGH PRECISION  
MOLD WORK**



**GORTON CIRCULAR TABLES** are precision built—for a lifetime of service. Simple, positive adjustments compensate for wear. Table surfaces are accurate within .0005" and work may be indexed to 5 minutes or less. A few of these tables are still available for immediate delivery. Standard sizes: 10", 12", 15" diameter. Write for Accessories Catalog 1317-D.

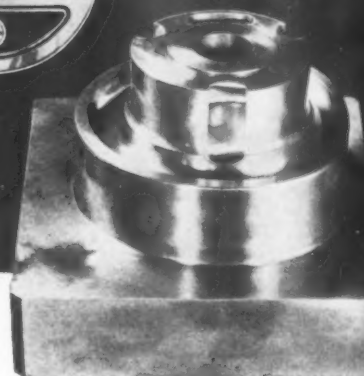
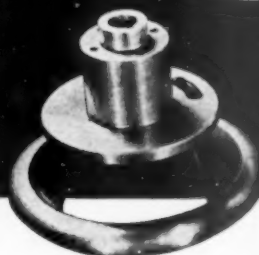
Shaping spokes for a plastic handwheel plunger mold within limits of .002" requires precision machine equipment. Both speed and accuracy are assured when a Gorton Super-Speed Mill with a Gorton Circular Table is used, as on this particular mold job at Eclipse Moulded Products Co., Milwaukee.

The mold is simply mounted on a 15" Gorton Circular Table, accurate within .0005" and indexing to 5 minutes or less. Three evenly spaced handwheel spokes and insert slot are machined in the plunger mold to match perfectly with the companion molds. The part, formerly made from an aluminum casting, is now molded

in bakelite at a much reduced cost.

The cavities were milled at a speed of 2200 RPM with cutters hand fed. Actual cutting time was 10 hours for this part of the job, although 18½ hours were needed to complete the 115-pound mold. The specially ground end mills and ball nose cutters were ground on a Gorton 375-2 Grinder designed for this type of work.

Gorton Super-Speed Vertical Milling Machines and equipment are especially suited for machining precision dies and molds. For expert advice on work of this type consult Gorton Engineers, specialists in Super-Speed Milling.



## **SUPER-SPEED MILLING DATA**

Machine—Gorton Super-Speed Vertical Milling Machine.

Part—Plunger for Handwheel Mold.

Material—CSM2 Machine Steel—58 Rockwell.  
Cutter—Gorton Super-Speed Single Flute End Mill and Gorton Ball Nose End Mill. (Ground on Gorton 375-2 Cutter Grinder).

Operation—Milling spoke slots in mold ¾" x 1" x 1 7/8", and insert cutout 14" deep, .875" wide, 1.938" long.

Holding—On Gorton 15" Circular Table.

Feed—Hand Feed.

Speed—2200 RPM.

Time—10 hours. (18½ hours to complete the 115-lb. mold).

Finish and Accuracy—Accuracy within .002" and very fine finish.

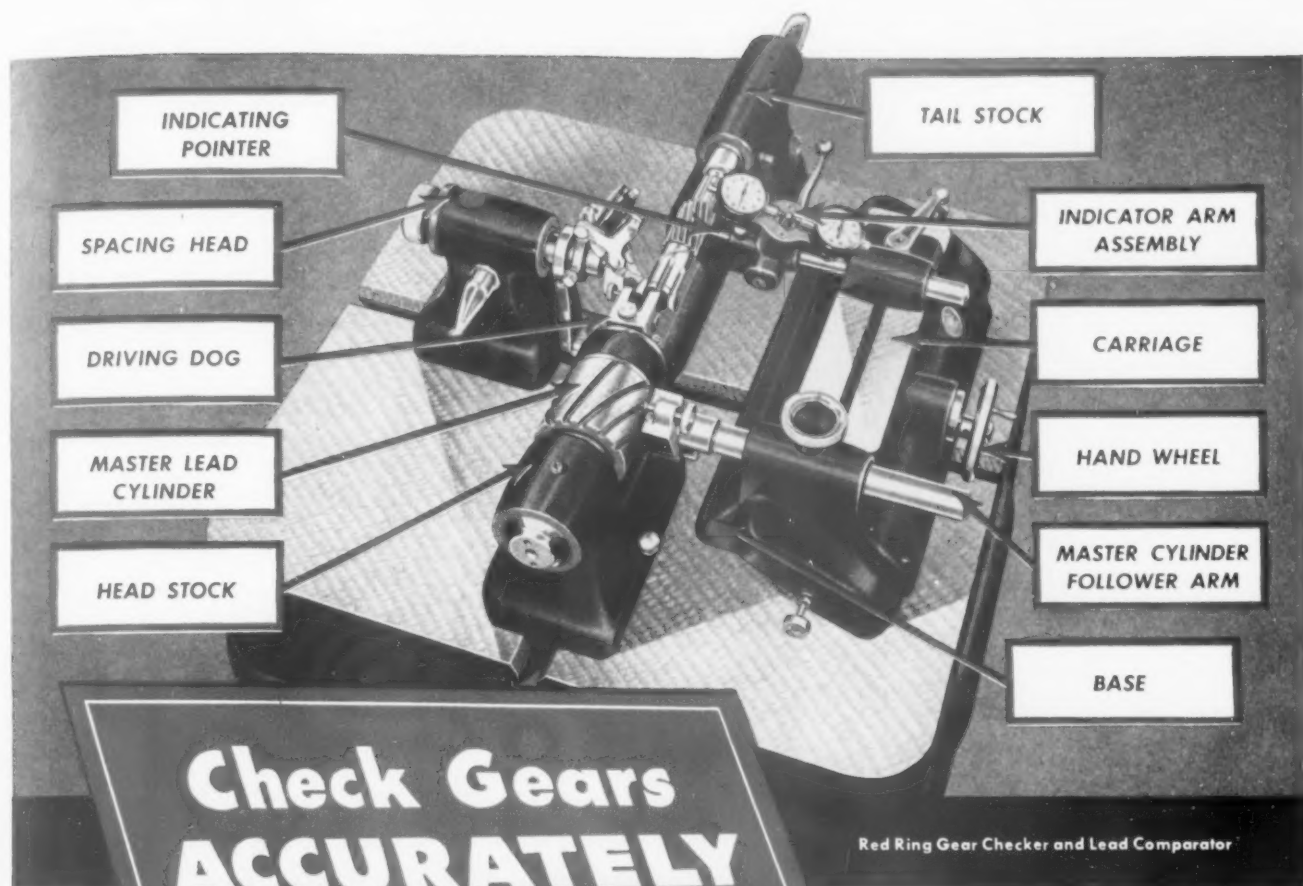
How to handle High Speed Vertical Milling jobs is explained in Catalog 1400-A covering Gorton Super-Speed Vertical Milling Machines. **WRITE FOR YOUR FREE COPY OF CATALOG 1400-A—TODAY.**



# **GEORGE GORTON MACHINE CO.**

1322 RACINE STREET, RACINE, WISCONSIN, U.S.A.

**SPECIALISTS IN ENGRAVING, DIE MAKING AND SUPER-SPEED VERTICAL MILLING**



Checks spur, helical and internal gears with or without integral shaft

Determines index, interference, helix angle, wobble, eccentricity and tooth size—also the lead of helical gears

Readings to .0001"

Typical small gears may be checked in less than one minute

Operator needs no special skill or training to inspect gears on a production basis

Lead is checked against a hardened and ground master lead groove



Write for  
descriptive literature

SPECIALISTS ON SPUR AND HELICAL  
INVOLUTE GEAR PRACTICE

ORIGINATORS OF ROTARY SHAVING  
AND ELLIPTOID TOOTH FORMS

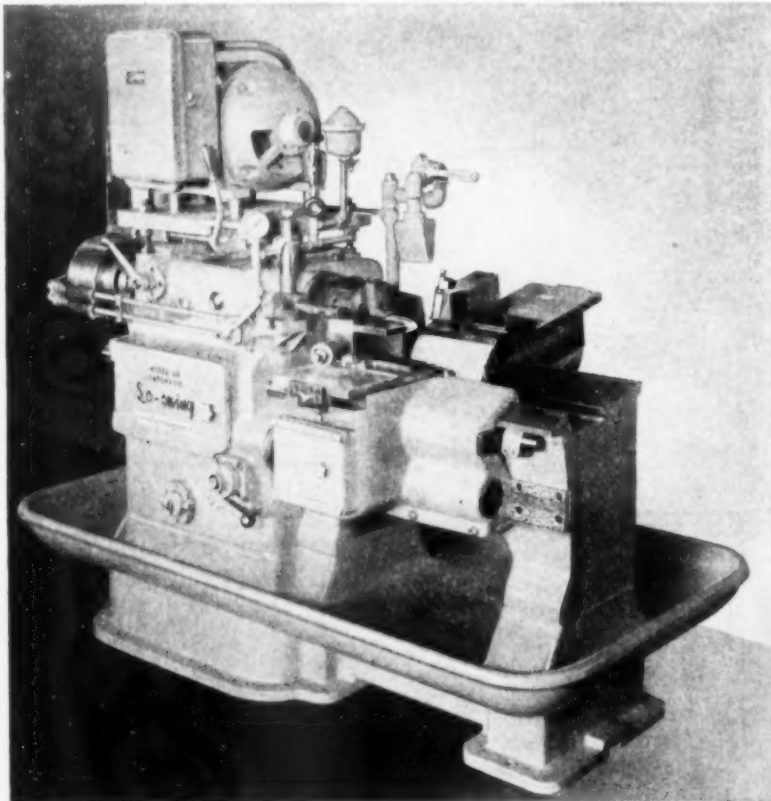
**NATIONAL BROACH  
AND MACHINE CO.**

RED RING PRODUCTS

5600 ST. JEAN·DETROIT, MICH.

# MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK

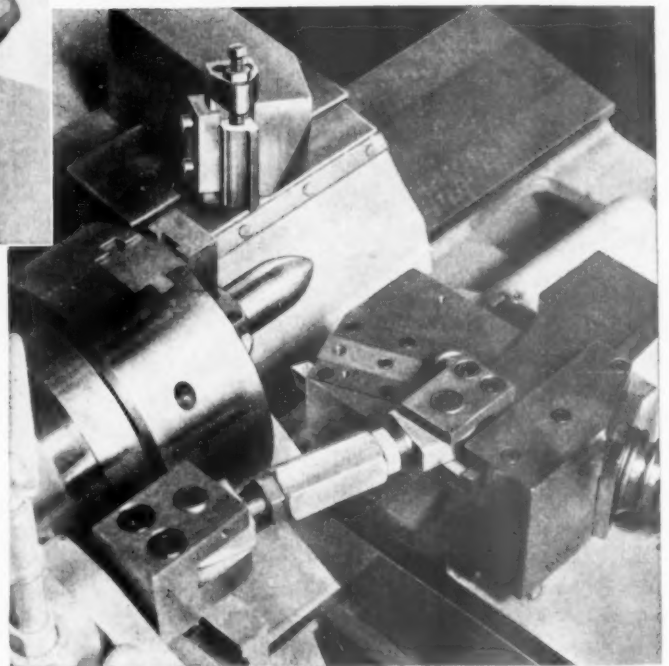


## Model "LR" Lo-Swing SPEEDS UP AUTOMATIC PRODUCTION OF 37 MM ARMOR- PIERCING SHELLS

**PROBLEM:** To automatically turn points and front bourrelet of 37mm. A. P. shells from rough forgings.

**SOLUTION:** The Model "LR" Lo-swing was selected for this job because of its sturdy, compact design and ease of operation by unskilled machine operators.

The work comes to the machine as a rough forging having approximately  $3/32$ " material to be removed from the diameter. It is held and driven with a three-jaw, air-operated chuck after being located in a definite position in the chuck in relation to the base of the shell so as to assure ample surplus material for facing the base in a subsequent operation. The close-up illustration shows the template-operated tool block, mounted on the front carriage slide, which turns the body and point of the shell over a length of 3". This front tool feeds towards the tailstock end of the machine and finish turns the point down to a diameter of approximately  $3/8$ ". The extreme point is then finished with a form tool mounted on the rear slide which enters the cut after the front tool has ceased cutting,



thus avoiding any tool marks which might otherwise be caused by a sudden pressure from the rear tool.

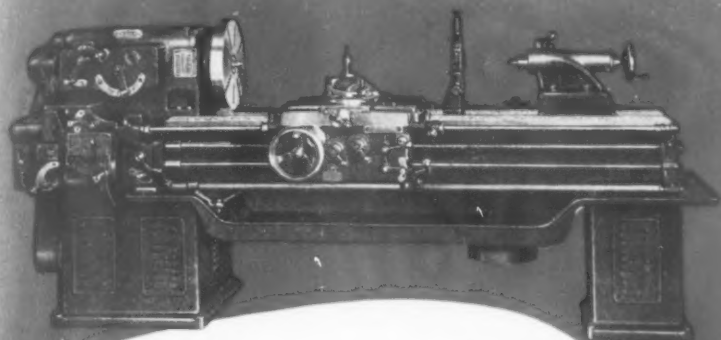
A Carbide tool is used in the template-operated front tool block while the rear forming tool is made of Stellite. A production of 82 pieces per hour can be easily maintained.

The Model "LR" Lo-swing Lathe is completely automatic and can be operated satisfactorily by an unskilled operator, who merely loads and unloads the shells and operates the starting lever.



# The mark of Lathe Performance and Economy

# Lathes



● Continuous tooth herringbone gearing has long been recognized as a superior type of drive to attain greater strength, smoother more efficient power. This type of gearing is one of the outstanding features of Sidney Lathe for the past fifteen years.

**TOOL ROOM LATHES.** Sidney offers tool room lathes in four sizes ranging from 14" to 20" inclusive. 16 Speed herringbone gear headstock—48 feed changes from .0027 to .172"—48 thread changes from 1½ to 92—forced feed lubrication—anti-friction bearings throughout are a few of the points contributing to the wide range adaptability and long lived accuracy of Sidney Tool Room Lathe.

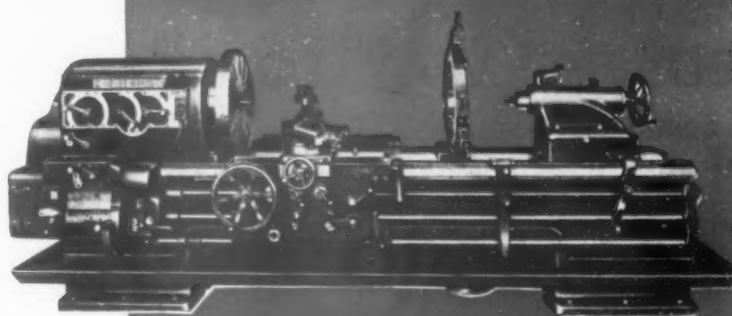
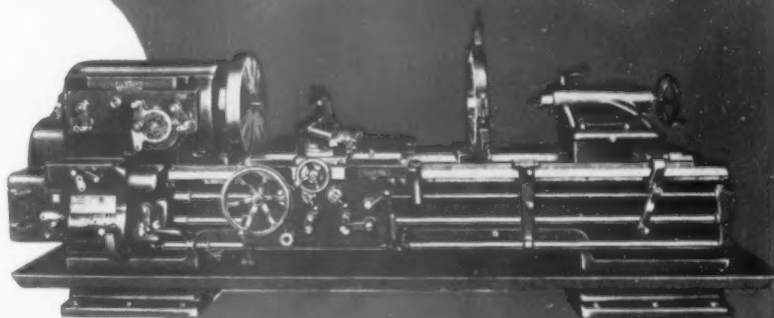
**16 SPEED HERRINGBONE GEARED LATHE.** Built in eight sizes from 14" to 36". This series of machines are husky and powerful to withstand heavy cuts yet extremely sensitive for thread chasing and finish turning. The Sidney Lathe Bed is exceptionally well braced to withstand heavy cuts—Double Wall Apron provides outer supports for all shafts in anti-friction bearings. The 14" and 16" machines provide spindle speeds from 14 to 562 RPM with higher optional speeds 25 to 1000 RPM and the 18" and 20" lathes have spindle speed range from 12 to 360 RPM or optional higher speed range 24 to 720 RPM. Here is range, speed and stamina combined in a well designed Lathe. The 24", 27", 30" and 36" sizes provides spindle speed range from 5 to 306 RPM and optional higher range 7 to 428 RPM. All speeds in geometrical progression.

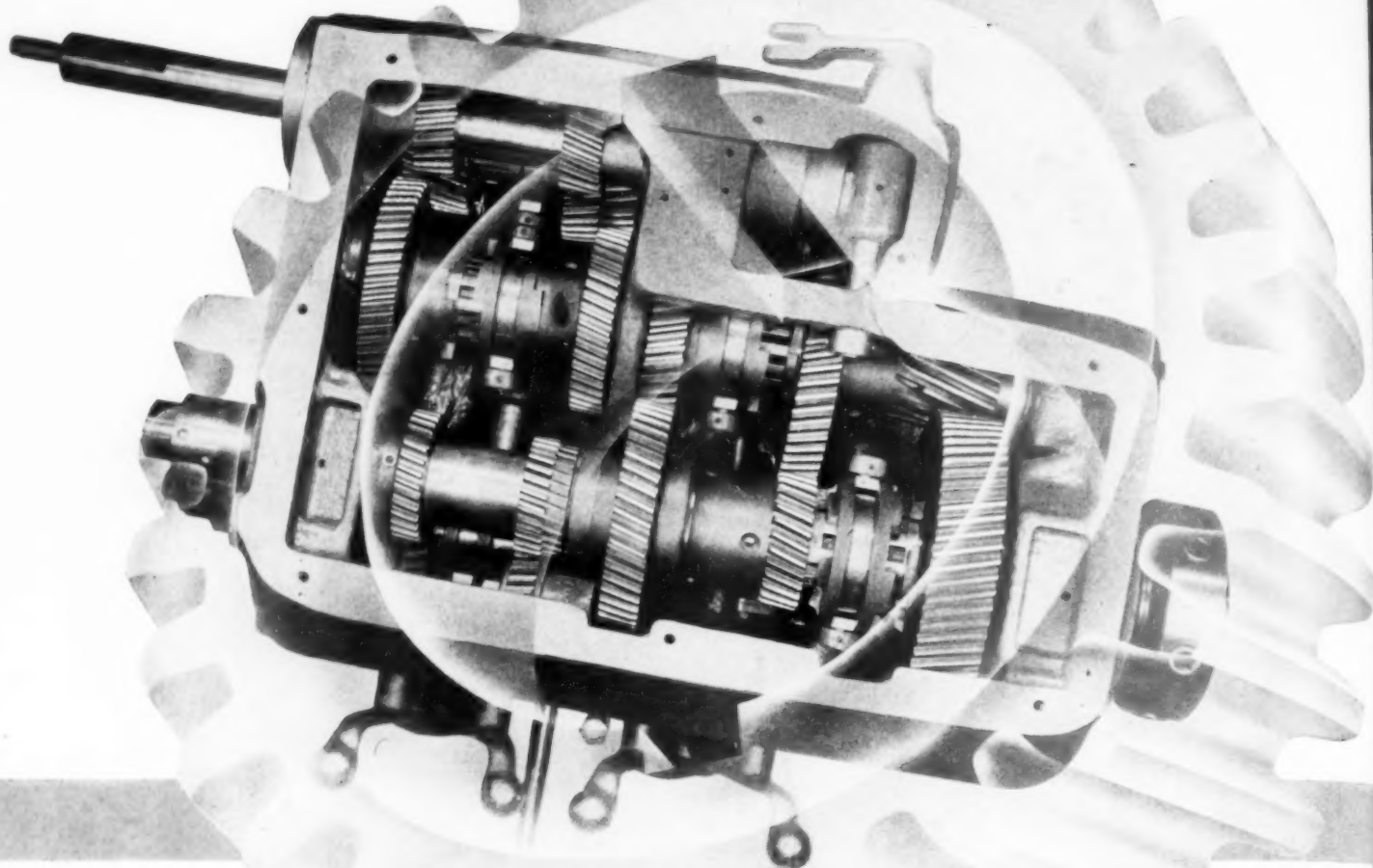
**12 SPEED SPUR GEARED HEAD LATHES.** The Sidney 12 Speed Model offers a size range from 14" to and including the 36" size. This model provides spindle speed range from 14 to 534 RPM with optional range from 25 to 950 RPM in the 14" and 16" size; 12 to 365 RPM with optional range 24 to 730 RPM in the 18" and 20" size; 8 to 318 RPM or optional higher range 14 to 555 RPM in the 24", 30" and 36" sizes with selective threads and feeds as provided in the 16 Speed Models.

**8 SPEED HERRINGBONE GEARED LATHE.** Built with dial or three lever control in five capacities from 14" to 24". Eight spindle speeds are available through either handwheel or three lever control from 13 to 414 RPM in the 14" and 16"; 13 to 300 RPM on the 18 and 20" and 8 to 350 RPM on the 24" size. Simplicity and massiveness characterize design and assure both accuracy and close tolerance work.

Bulletins available  
for each model

The **SIDNEY**  
MACHINE TOOL COMPANY *Sidney, Ohio*





# THE *Phantom Gear*

## LED THE WAY TO HEADSTOCK IMPROVEMENT

IMPROVEMENTS in Monarch lathes don't just happen. They result from open-mindedness, courage to try new methods, work to carry them through. Here at Monarch, we call this urge for new accomplishments "The Phantom Gear."

This driving force brought you the first helical geared headstock, with that silent, smooth power transmission that has so improved lathe work and performance. It gave you the advantages of anti-friction spindle and shaft bearings, integral milled splines and quick, smooth speed changes

THE MONARCH MACHINE TOOL COMPANY . . . SIDNEY • OHIO

which, with other major improvements, have led Monarch lathes to their commanding place in industry.

★ ★ ★

The force of Monarch's "Phantom Gear" will continue. Today, it stimulates 1500 men to deliver a lathe every working hour, day and night, for National Defense. Tomorrow, it will energize Monarch to give you still better lathes, to produce more goods for more people at lower cost.

# MONARCH



# LATHES

COVER THE TURNING FIELD

### *Monarch's March of Progress*

Many of the outstanding improvements in lathes came from Monarch, such as:

- Helical geared headstock*
- Anti-friction bearing mountings for all rotating parts*
- Flanged spindle nose*
- Automatic force feed lubrication*
- Anti-friction bearing taper attachment*
- Flame-Hardened beds*
- Automatic sizing for all size lathes*

These accomplishments show the urge at Monarch to build better lathes. This same desire will be reflected in every Monarch lathe of the future. It will pay you to keep in touch with Monarch developments.

# STANDARD STOCK TOOLS

*Finished Ground*

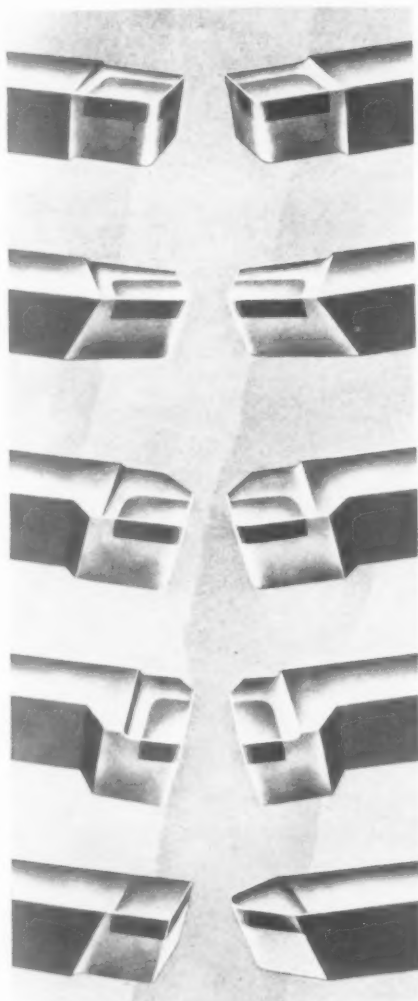
**METHOD**

**1**

**Vascoloy  
RAMET**  
T M REG U. S. PAT OFF

**5-METHOD**

**COMPLETE TOOL SERVICE  
for MAXIMUM PRODUCTION**



These standard stock tools are available with a choice of three grades of Ramet Cemented Carbide Blanks. With a variety of sizes in ten styles there are 164 standard tools in all.

Vascoloy-Ramet Standard Tools are finished ground ready to use. You can also regrind any of them to obtain different cutting angles to suit particular cutting conditions. The generous size of the blanks permits the modification of these tools to meet many special or form tool requirements. With the three grades and the many sizes and styles, these standard tools will take care of the majority of all the turning, boring and facing operations on steel, cast iron, and abrasive materials.

Full particulars on all Vascoloy-Ramet Standard Tools and Blanks are contained in the new catalog and price list VR-421. Write for your copy.

*Prompt Delivery*

*on Standard Tools and Blanks*

**VASCOLOY-RAMET  
CORPORATION**

NORTH CHICAGO, ILLINOIS

DISTRICT SALES AND SERVICE IN PRINCIPAL CITIES

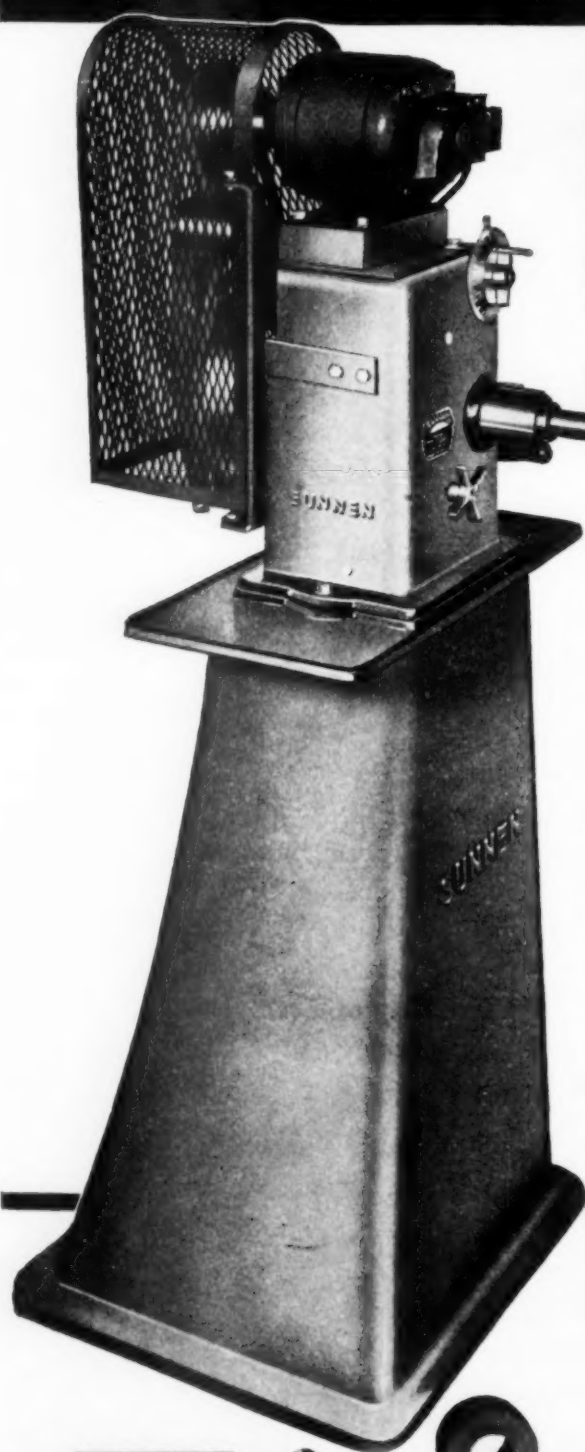
IN CANADA: Carbide Tool & Die Company, Ltd., Hamilton, Ont.



4216

**THE SUPERIOR TANTALUM-TUNGSTEN CARBIDE TOOLS**

# DON'T THROW AWAY YOUR BROACHES or REAMERS Because they are a LITTLE UNDERSIZE



## Use the SUNNEN "MA" Precision HONING MACHINE to take out that Last Thousandth or so . . .

Reamers and broaches are expensive — and hard to get! Don't discard them simply because they are a little undersize. Go ahead — use them as long as you can — and remove that last thousandth or two with the Sunnen "MA" Precision Honing Machine.

Leading defense manufacturers the country over are using this inexpensive machine to accurately finish internal cylindrical surfaces from .185" to 2.400". Accuracy within .0001" is guaranteed and has often been held to .000025" in production work.

### Solves Five Important Problems

1. Corrects errors of out-of-roundness and taper caused by previous operations.
2. Produces super-smooth surface finishes.
3. Accurately finishes holes to very close tolerances both as to size and straightness.
4. Maintains alignment already established by previous operations.
5. Provides simple, low cost method for accurately duplicating sizes.

### Relieves Big Internal Grinders—Can Be Set Up in a Minute—Does Not Require Skilled Labor

Fast—not only in production, but can be set up and work located in a minute. Any intelligent workman—or girl—can produce precision work with only a few hours' practice. You can shift your highly skilled labor to other jobs.

### Write for FREE Bulletin

giving complete information and showing many examples of use. Or if you prefer, we'll have a sales engineer call and demonstrate this equipment in your plant, on your job.

**SUNNEN**



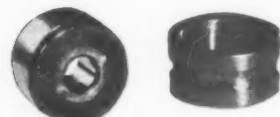
Diesel Engine Fuel Injector Cylinder "So accurate that a piston can be fit within .00005 inch."



Hardened Steel Ring Gauge—finished to an accuracy of .000025" for roundness and straightness.



Molded Composition (Bakelite) Pulleys. Molded composition is a difficult material to machine but it can be easily honed to a smooth finish.



Drawing and Blanking Die "Saves time in producing smooth base metal finish."



Inner Bearing Ring "Accurately removes last 'tenths' of stock."



Stone Lettering Air Hammer "Sunnen honing does in five minutes what it took 20 minutes to do by lapping."



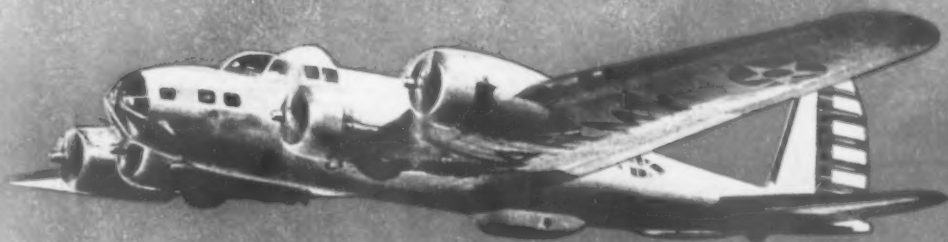
Bronze Valve. The Sunnen method of honing is used to secure a high finish and accuracy.



**SUNNEN PRODUCTS CO.**

7932 Manchester Ave. St. Louis, Mo.  
Canadian Factory: Chatham, Ontario



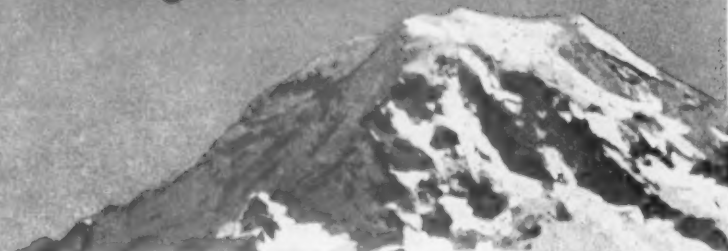
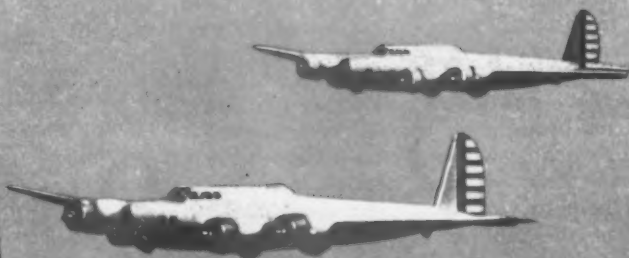


# ASSIGNMENT: *Victory*

● American industry is today charged with the greatest responsibilities in history.

★ ★ ★

Built into every National Cutting Tool is a full measure of our share of these responsibilities.



# NATIONAL



TWIST DRILL  
REAMERS, HOMS  
MILLING CUTTERS  
COUNTERBORERS  
SPECIAL TOOLS

## TWIST DRILL AND TOOL COMPANY

Home Office and Factory—DETROIT, MICH.

Tap and Die Division—Winter Brothers Co., Wrentham, Mass.

Sales Branches: New York • Chicago • Philadelphia • Cleveland • San Francisco • Baltimore • Portland, Ore.

# Which of these are your Big Production Problems NOW?

- Getting increased output from machines and presses?
- Too frequent repairing and regrinding of tools and dies?
- How to conserve vital tool steels?
- Training tool makers and apprentices faster and better?

## MAY WE HELP YOU FIND THE ANSWERS?

Changing over to full wartime production and jumping your plant capacity above the old "maximum" brings up a lot of tough problems—all at once.

If you have more than your share of these problems brought on by industry's conversion to wartime work—perhaps Carpenter's vast experience with tool steel problems can be of help to you. We can help iron out some of the tool-making kinks, and help you get the new jobs done in the shortest possible time.

A talk with your nearby Carpenter representative can often lick a tool problem that is causing production trouble. Lost time spent for regrinding, repairing and replacing tools that fail prematurely can often be saved. And the services of Carpenter's

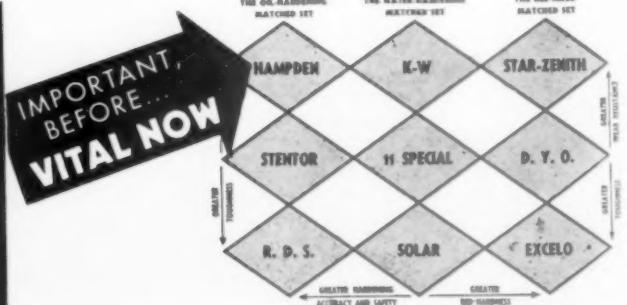
Metallurgical Department are available to help you get to the bottom of tool troubles anywhere along the line.

Another shirtsleeve assistant for your tool room and hardening room is "Tool Steel Simplified". Your tool designers will find much of value in the chapter on "The Relation of Design to Heat Treatment". Three chapters on heat treating offer many helpful ideas for your hardening room. "Spark Testing", "Furnace Atmosphere", "Quenching" and many other chapters in this timely handbook will be valuable aids in solving your tool production problems *now*. "Tool Steel Simplified" costs only \$1.00 in the U.S.A.—\$3.50 elsewhere, so put it to work in your plant. Send for your copy today.

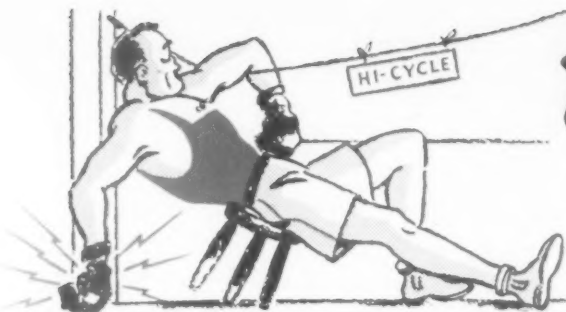
## THE CARPENTER STEEL COMPANY

Dept. 41 - READING, PA.

**Carpenter**  
**MATCHED**  
**TOOL STEELS**



THE TOOL ENGINEER



# BOUT of the O'TOOLS

10 ROUNDS—AIR VS. HIGH-CYCLE GRINDERS

## ROUND 4: AIR GOT AROUND FASTER

**JOB:** Cone-grinding cast iron containers for enameling. Formerly used flexible-shaft grinders. Wanted to get into the corners and all around . . . FASTER.

Had ample air supply. Called in the *Rotor Analyst* for unbiased opinion on AIR vs. HIGH-CYCLE grinders.

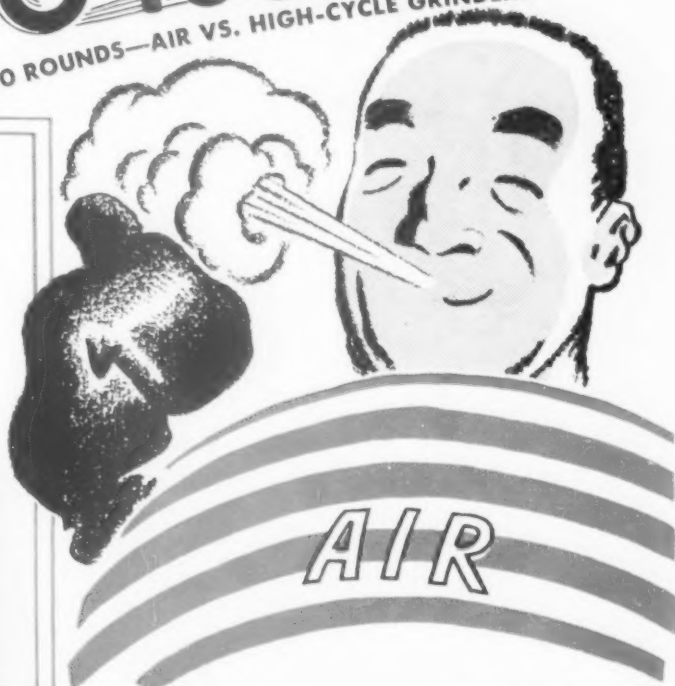


### SCORE:

AIR out-pointed HIGH-CYCLE (and the semi-finalist, flexible shafts) these ways:

- 1 Increased production 10% compared to former type of grinders.
- 2 Cut maintenance cost 15% to 20% compared to former type of grinders.
- 3 Easier to handle. Their Rotor AIR grinders weigh only 9 lbs., compared to 12 lbs. for HIGH-CYCLE grinders. Made possible greater maneuverability and smoother grinding for this light-duty work.

Purchased 5 Rotor Powerplus AIR Grinders—and reordered two more recently.



**SPARKS mean OUTPUT  
KEEP 'EM FLYING!**

The *Rotor Analyst* has a strong plan of attack to boost production with portable tools—at a minimum of investment cost. Shops using all types of tools have benefited from his practical knowledge and unbiased analysis. His service is yours for the asking.

*The Rotor Analyst has 65 different AIR tools and 59 different HIGH-CYCLE tools with which to solve your problems.*



AIR

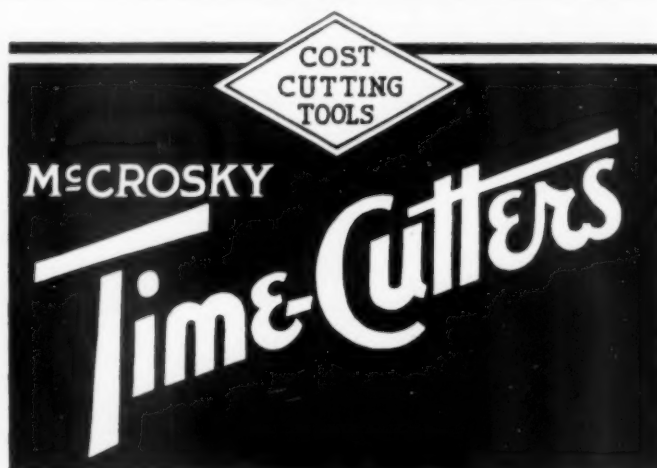
## THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



HIGH CYCLE



## WHERE TIME COUNTS

You can count on McCrosky's line of  
**TIME-CUTTERS**

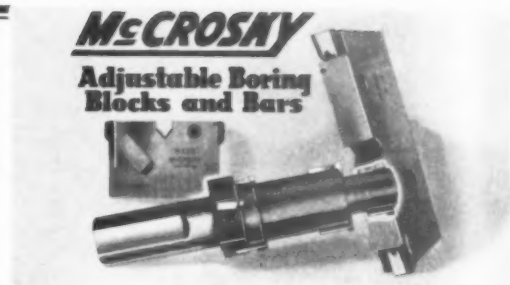
McCrosky inserted-blade metal-cutting tools have the extra rigidity essential to faster production — and adjustment features that cut resharpener down-time to a minimum.

On multi-operation drill press and lathe jobs, WIZARD Quick-Change Chucks and McCrosky Turrets cut time by eliminating time-out for tool changes.

*Ask for descriptive bulletins  
by numbers*



15  
B



15  
D



15  
M



15  
E

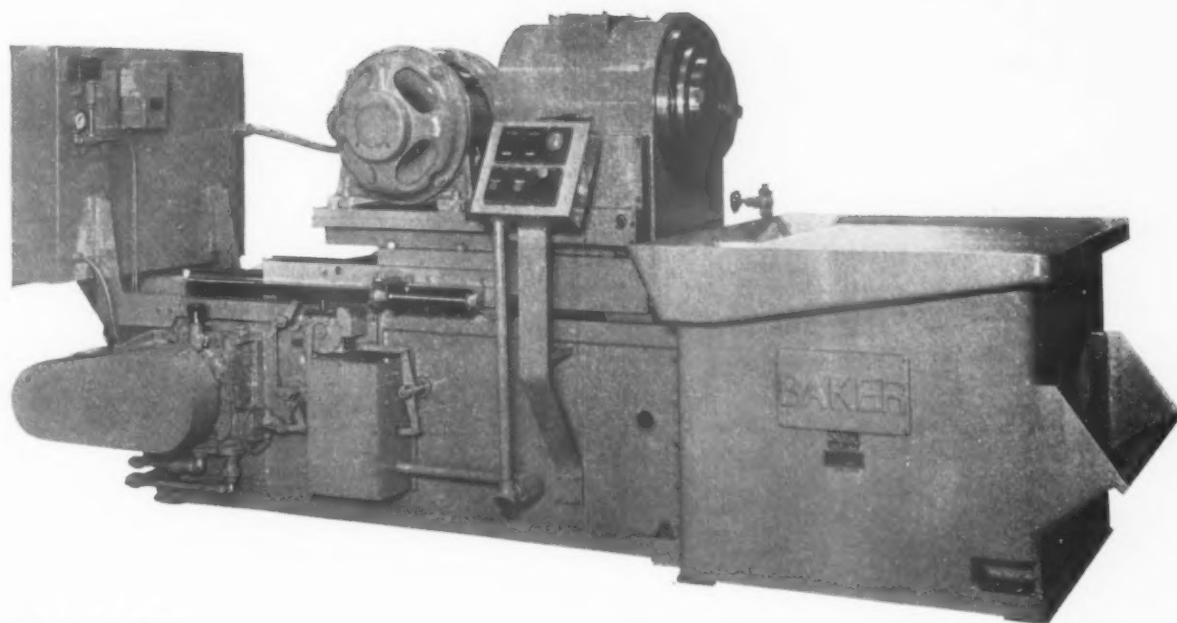


15  
A



# BAKER

## HORIZONTAL HEAVY DUTY DRILLING AND BORING MACHINE



### IN USE ---

This type of machine is in successful operation for drilling from solid and rough boring in airplane propeller hub manufacturing plants, for horizontal drilling and boring operations in landing gear parts, and for heavy duty drilling and boring in gun breech ring forgings.

### FEATURES ---

Hydraulic feed floor type unit, automatic in its cycle, with push button control. The saddle is mounted on four nitralloy bars with X-alloy bushings which insures longer life because it eliminates chip scoring. The single spindle head unit is mounted on the saddle. The final drive is to a very large size spindle with pre-loaded ball bearings through means of enveloping cone type worm and worm gears. The standard machine is furnished with two quick changes of speed, and, if the head is driven from a two-speed motor there are four quick changes of speed. The spindle driving end is flanged, allowing for the mounting of large diameter facing cutter heads.

WRITE FOR NEW CIRCULAR AND ENGINEERING DATA SHEET

**BAKER BROTHERS, INC. TOLEDO, OHIO, U. S. A.**

DRILLING - BORING - TAPPING - KEYSEATING - CONTOUR GRINDING MACHINES

# This *protective* step leads to 49\* more!



Carbon analysis in P-K Laboratory first step in Quality-Control routine.

Parker-Kalon's Quality-Control Laboratory makes sure that every P-K Socket Screw has the right beginning. Thorough laboratory tests of the raw material are followed by numerous tests and inspections that result in Parker-Kalon's high standard of quality. Physical and mechanical characteristics must surpass all working requirements.

The Parker-Kalon Laboratory controls the entire production of these Socket Screws. This is your assurance of 100% dependability! "Doubtful screws"—screws that look all right but some of which fail to work right—have been eliminated by a complete step-by-step Quality-Control routine which has no counterpart in the screw-making industry.

This protection against costly delays and rejects caused by "doubtful screws" is ample reason why essential war production industries specify P-K Socket Screws. Besides, they cost no more! Parker-Kalon Corp., 190-198 Varick Street, New York.

\*49 separate "check-ups" on Cap Screws alone!



## Quality-Controlled

Complete test and inspection routine covers: Chemical Analysis; Tensile and Torsional Strength; Ductility; Shock Resistance under Tension and Shear; Hardness; Head diameter, height and concentricity; Socket shape, size, depth and centrality; Class 3 Fit Threads; Clean-starting Threads.



REPORT ON INCOMING MATERIAL

Size: 3/8" Heat: 8159 Supplier: A.S.M.  
 Date Rec'd: 2/4/42 P.O. No. 6421 Analysis: SAE 3135L Master B: Stockwell Type  
 No. Cods: 15 No. Samples: 15 Tested by: J.P. Approved by: L.O. Date: 2/4/42

Size	Chemical Analysis	Mech. Properties	Min. Temp. Tensile to Br.	Min. Temp. Yield to Br.	Min. Temp. Elong. in 2 in.	% Red. in Area	R.R. Rec'd	R.C. Rec'd	R.C. Temp.	Structure	Scale
5/16"	3.66%	5020	69,250	71.3%	77.5	50	40.5	40.5	40.5	40.5	40.5
22"	3.66%	4900	67,600	71.3%	75.5	50	40.5	40.5	40.5	40.5	40.5
17"	3.69%	4980	68,740	74.4%	77	51	41.5	41.5	41.5	41.5	41.5
9"	3.68%	4970	68,750	69.9%	77	52.5	40	40	40	40	40
23"	3.70%	5090	66,600	72.1%	78	50	40.5	40.5	40.5	40.5	40.5

Drawn at 775° F for 60 minutes—  
 Wire OK for all operations—

## PARKER-KALON

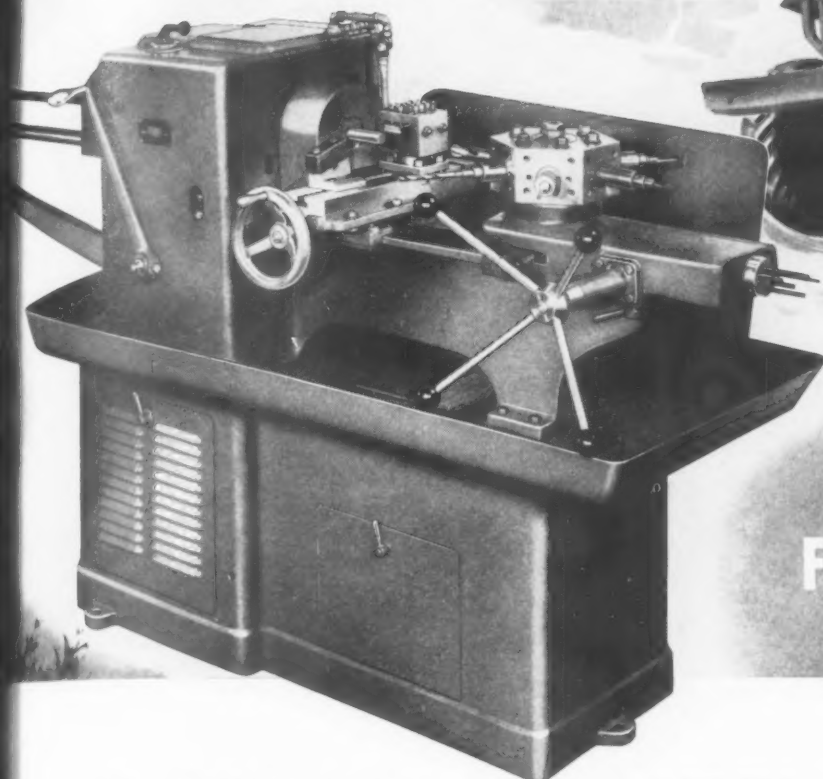
### Quality-Controlled

## SOCKET SCREWS

Give the Green Light

to Defense Assemblies

# VERSATILE AS A "JEEP"



## IN THE BATTLE FOR PRODUCTION

### OSTER NO. 601 SIMPLIFIED TURRET LATHE

The "Jeep" and the Oster No. 601 machine have a lot in common. Both are versatile, easy to handle, quick-acting, ruggedly built, low in cost and high on performance. Both meet vital war needs NOW and assure wide use in the post-war future.

#### Batteries of Oster No. 601's in Action on Shell Contracts!

First and second operation jobs on 20, 37, and 40mm shells are now being handled by Oster No. 601 Turret Lathes. The manually controlled, six-position turret makes it easy to train new men rapidly. *Highly skilled operators not required.*

*Cost?* Without tools, the Oster No. 601 costs less than \$2000.00. *Delivery?* In 12 weeks or less! *But act NOW to assure prompt scheduling of your order!*

#### QUICK DESCRIPTION OF THE OSTER NO. 601 SIMPLIFIED TURRET LATHE

Motor driven (2 H.P. two-speed motor). Designed with hand feed to cross slide. Equipped with manually operated 6-position turret; or with plain saddle (where three or fewer operations in sequence are to be performed.)

Two optional types of drive: WORM DRIVE (for making heavy forming cuts at relatively slow speeds); DIRECT DRIVE (for small diameter work or for non-ferrous metals at speeds up to 3000 R. P. M.)

Automatic chuck capacity: 1-1/2" round bar; 1-1/16" square bar; 1-5/16" hex bar. Swing over bed: 14". Swing over cross slide: 6-1/2". Carriage travel: 11" when there is a cross slide on 33" main ways. Maximum movement of screw feed cross slide is 6-1/2" and 4-1/2" for lever feed cross slide.

## OSTER

# Let's GO!

THE OSTER MFG. CO. • 2063 East 61st St., Cleveland, Ohio

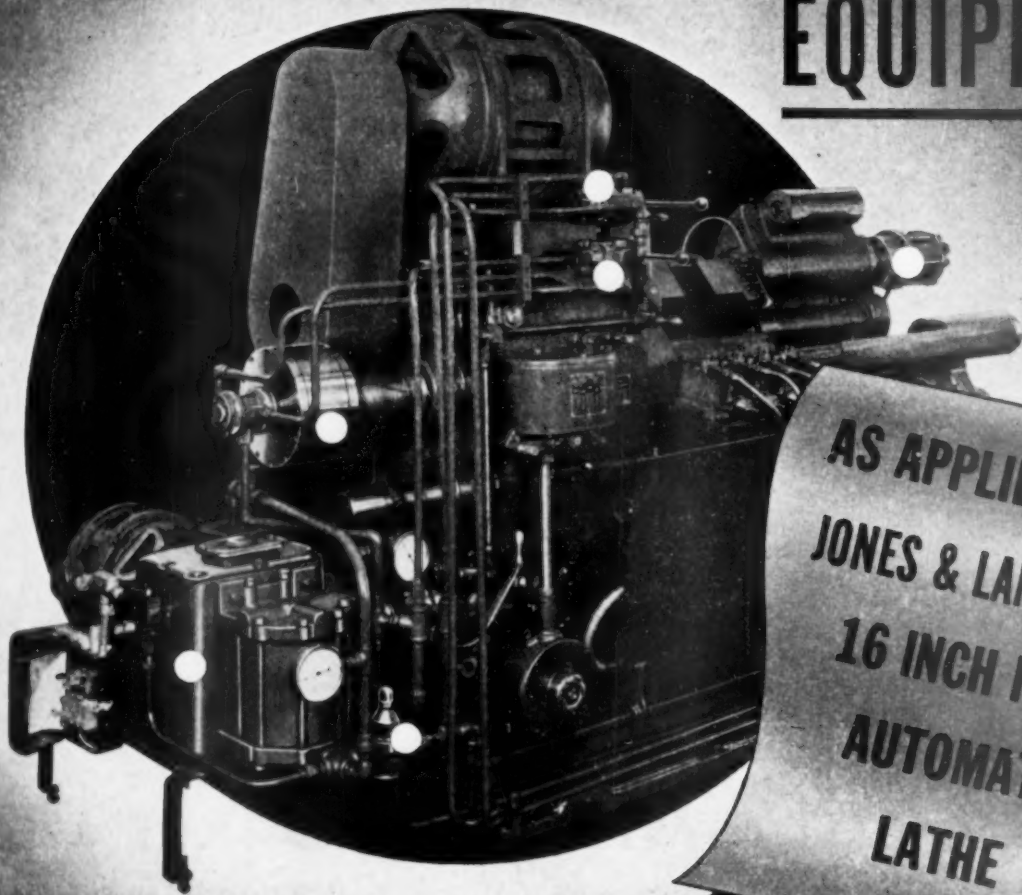
Rush, by return mail ..... copies of Catalog No. 27-A which contains full description and detailed illustrations of No. 601 Turret Lathe.

NAME .....

ADDRESS .....

CITY..... STATE.....

# **"LOGAN" HYDRAULIC EQUIPMENT**



**AS APPLIED TO  
JONES & LAMSON  
16 INCH FAY  
AUTOMATIC  
LATHE**

● This Jones and Lamson 16" Fay Automatic Lathe is equipped with a "LOGAN" Hydraulic Power Unit, shown at left above. This accumulator model power unit is an entirely independent source of fluid power supply and it assures constant pressure for continuous and efficient operation of the hydraulic cylinders. In addition to the power unit, this Fay Automatic Lathe is equipped with a "LOGAN" Model "HR" Rotating Type

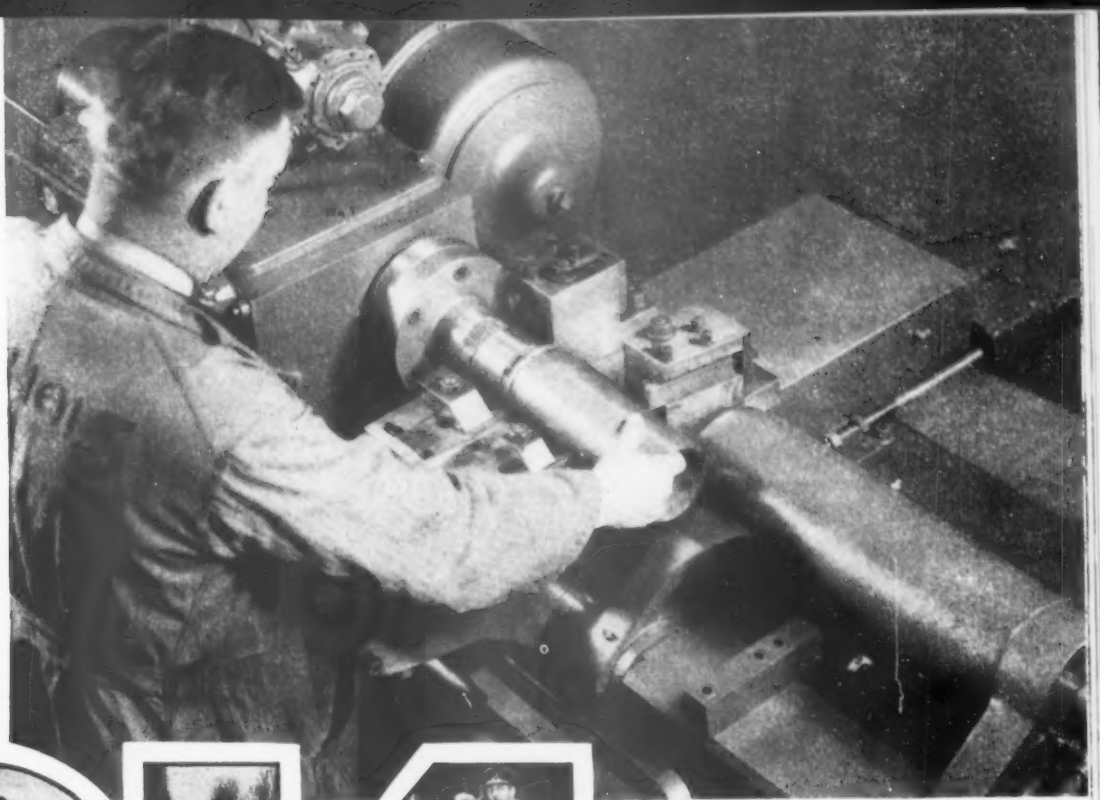
Hydraulic Cylinder, "LOGAN" Model "HA" Non-Rotating Type Hydraulic Cylinder, two Model 4095 Hand Operated "LOGAN" Hydraulic Control Valves, a Model 8035 "LOGAN" Reducing Valve and accessories to complete the hydraulic circuits. "LOGAN" Representatives and "LOGAN" Engineers will be glad to make recommendations on your problems.

★ **LOGANSPORT MACHINE, INCORPORATED** ★

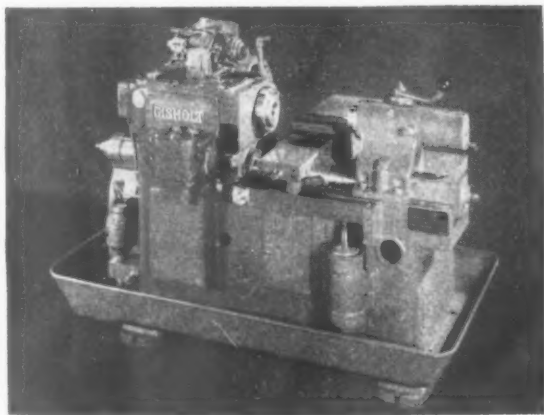
902 PAYSON ROAD

LOGANSPORT, INDIANA

Manufacturers of Air and Hydraulic Devices, Chucks, Cylinders, Valves, Presses and Accessories



# 4 WAS NOTHING LIKE THIS!



**THE GISHOLT HYDRAULIC AUTOMATIC LATHE** is the last word in high speed machining for many cylindrical parts. With all functions controlled by one simple lever, the operator has only to start the machine, chuck and unchuck the work. All other operations are fully automatic. Designed for chucking and between-centers work, the Gisholt No. 12 Automatic Hydraulic Lathe enables you to combine higher production speeds with extremely close limits of accuracy. Literature on request.

Who would have believed, during the frantic production of the last war, that parts like these could ever be machined so easily, so quickly, and so accurately?

Yet today, with practically no effort, this smooth-working hydraulic automatic lathe is turning cylinder sleeves—and many other parts—with a degree of precision that few master craftsmen could maintain. And production speed is four or five times faster than in 1914!

Craftsmanship? No!—not on the part of the operator! For it takes but little experience and skill to operate this Gisholt Automatic Hydraulic Lathe. The machine itself has become the craftsman in 1942!

*Look ahead . . . keep ahead . . . with Gisholt improvements in metal turning*

**GISHOLT MACHINE COMPANY**  
1229 EAST WASHINGTON AVENUE • MADISON, WISCONSIN



**TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES**

---

# TO ALL USERS OF BORING TOOLS

---

Today, Davis Boring Tools, like most industrial products throughout the United States, are still back-ordered. In fact, no industry is feeling the impact of these strenuous Defense days more than the small tool industry.

We assure you that we anticipated the emergency months ago, by adding more floor space—more equipment—more skilled men in every department—to *double* our production.

Yet because this increased production is mainly on Defense orders, hardship is being inflicted upon many of you civilian tool users, who in the past have been so loyal in favoring us with your business.

We know how badly you need Davis Boring Tools, and we assure you that your orders will be taken care of just as efficiently and promptly as the national emergency will permit. Thanks again for your patience and understanding.

## DAVIS BORING TOOL DIVISION

Larkin Packer Co., Inc. • St. Louis, U. S. A.



# RACINE



# SPEED... for National Defense

## HYDRAULIC *High Speed* METAL CUTTING MACHINES

for  
**PRECISION**  
•  
**PRODUCTION**  
•  
**ECONOMY**

It takes a lot of cutting off to keep pace with the production requirements of American Industry geared to National Defense, but it's for just such high speed continuous operation that RACINE Hydraulic Saws are built.

The RACINE line offers fully Automatic Hydraulically operated Sawing Machines in five different models ranging in capacity from the RACINE Oil Cut, 6" x 6" to RACINE Heavy Duty Hydraulic, 10" x 10" to 12" x 16"—These saws will accurately measure and cut off pieces anywhere from 1 64" to 54" in length and can be equipped to handle 12, 16, and 20 foot bars or larger.

High speed production without waste of material and with economy of tools is imperative in times of emergency. RACINE Hydraulic Saws do just that by blade saving, oil-cushioned hydraulic power and by accurate fast cutting. Write for information today or have one of our specialized agents located nearest you call and explain.

# RACINE

TOOL & MACHINE CO., RACINE, WIS.

# RACINE

# A COMPLETE LINE

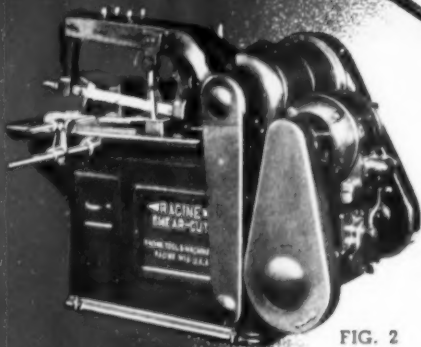


FIG. 2



FIG. 3



FIG. 4

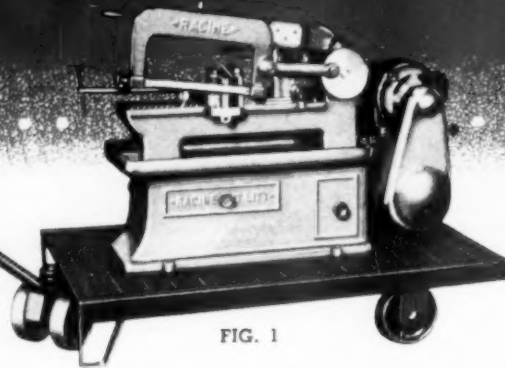


FIG. 1

Racine offers a full line of standardized and special machines to meet your metal cutting problems. Representative machines are briefly illustrated here . . . complete literature and specifications can be had upon request.

FIG. 1—Any of RACINE machines can be equipped with portable handling equipment as is the Racine Utility Saw illustrated here. Investigate our special turntable machines, spruce cutters, and other sawing machines.

FIG. 2—RACINE Shear Cut Production Saws. The exclusive feature of positive, progressive screw feed makes them the outstanding production machines of their size. Each cut is made in exactly the same length of time. No guess work in setting production costs. 6" x 6" and 8" x 9". Write for bulletin 212-B.

FIG. 3—RACINE Shear Cut Production Saws. The exclusive feature of positive, progressive screw feed makes them the outstanding production machines of their size. Each cut is made in exactly the same length of time. No guess work in setting production costs. 6" x 6" and 8" x 9". Write for bulletin 212-B.

FIG. 4—The RACINE Utility Saw, Wet Cut Model, 6" x 6". The wonder saw at a remarkable low price. Great simplicity. Hydraulic feed and pressure. 2 or 3 speed models available. A general all around shop saw. See Catalog No. 70-B.

FIG. 5—RACINE Hydraulic Heavy Duty Model. Capacities 10" x 10" to 14" x 20" with hydraulic feed and control. Guaranteed accuracy and fastest sustained production speeds. The flexible hydraulic control makes these machines the most versatile saws on the market today, cutting the thinnest-walled tubing to tool steels and die-blocks. A real production machine. Write for Catalog No. 80-B.

FIG. 6—The RACINE Oil Cut, hydraulic feed machine—a general purpose shop saw—fast, accurate, dependable—new in principle, modern in design—3 speeds—capacity 6" x 6". Write for Catalog No. 60-B.

FIG. 7—The Dry Cut Model of RACINE Utility Saw, still lower in price but accurate, fast and dependable. The auxiliary machine for large shops. A producer for small shops. No machine built to match this at the price. Write for Catalog No. 70-B.

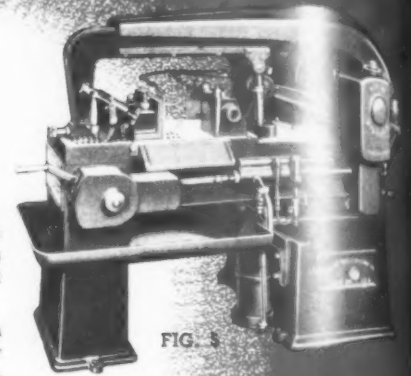


FIG. 5

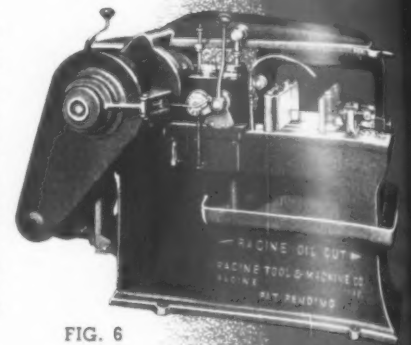


FIG. 6

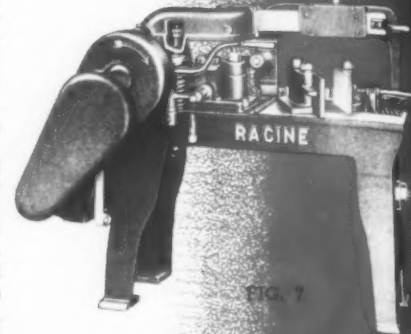


FIG. 7

## METAL CUTTING MACHINES for EVERY SIZE and PURPOSE

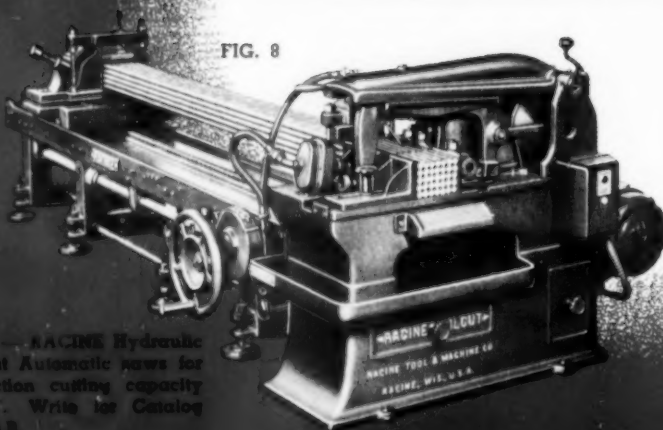


FIG. 8

FIG. 8—RACINE Hydraulic Oil Cut Automatic saws for production cutting capacity 8" x 6". Write for Catalog No. 60-B.

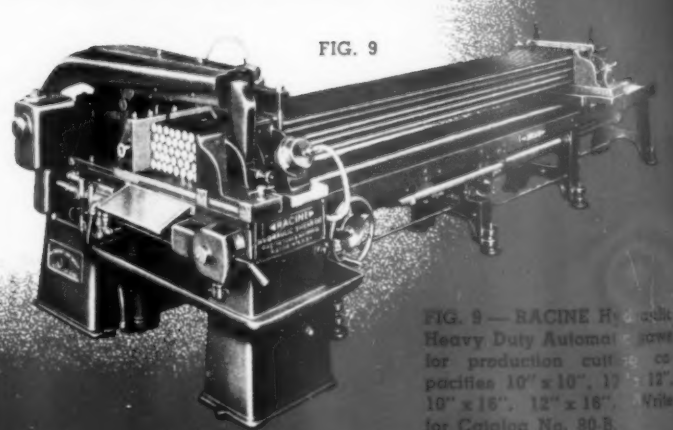


FIG. 9

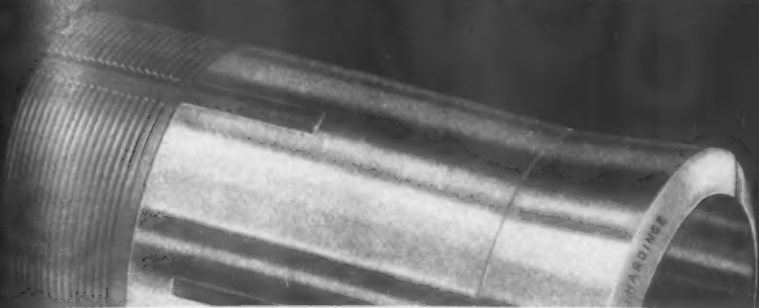
FIG. 9—RACINE Hydraulic Heavy Duty Automatic saws for production cutting capacities 10" x 10", 12" x 12", 10" x 16", 12" x 16". Write for Catalog No. 80-B.

RACINE TOOL & MACHINE CO.

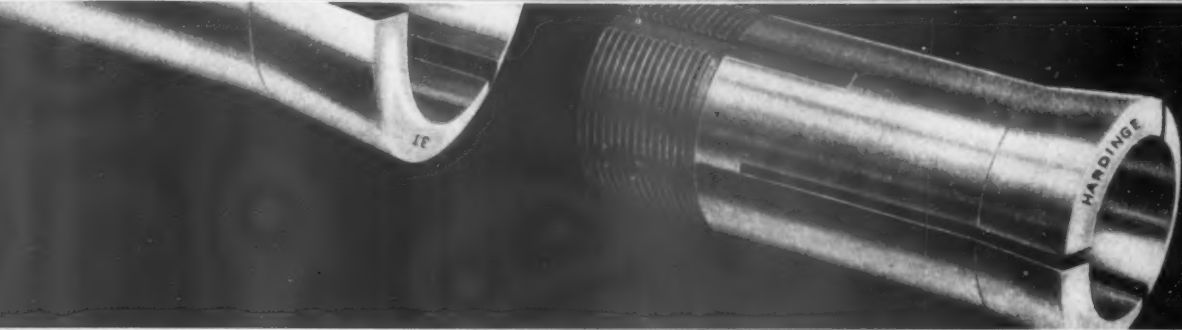
RACINE, WISCONSIN




SPECIFY **HARDINGE** COLLETS...



FINISHED SIZES CARRIED IN STOCK



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**M**ACHINE tools are important but, without the needed collet, they are useless. Avoid unnecessary delays and avail yourself of a good service by specifying **HARDINGE** Collets. Do this when ordering collets only, or when ordering Collets with Lathes and Milling Machines

of any make or size. **HARDINGE** Precision Collets cost no more than other Collets.

**HARDINGE** collet stocks are carried in these cities for service to our customers: Elmira, Hartford, New York, Rochester, Cleveland, Detroit, Chicago, Los Angeles and San Francisco.

ASK FOR THE LATEST **HARDINGE** COLLET BULLETIN NO. 41.

**HARDINGE BROTHERS, Inc., ELMIRA, N. Y.**

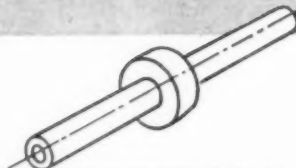
"PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR **HARDINGE**"

# Now!

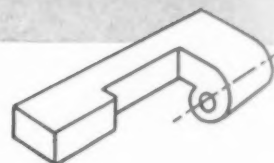
## A RIFLE DRILLER FOR PARTS LIKE THESE



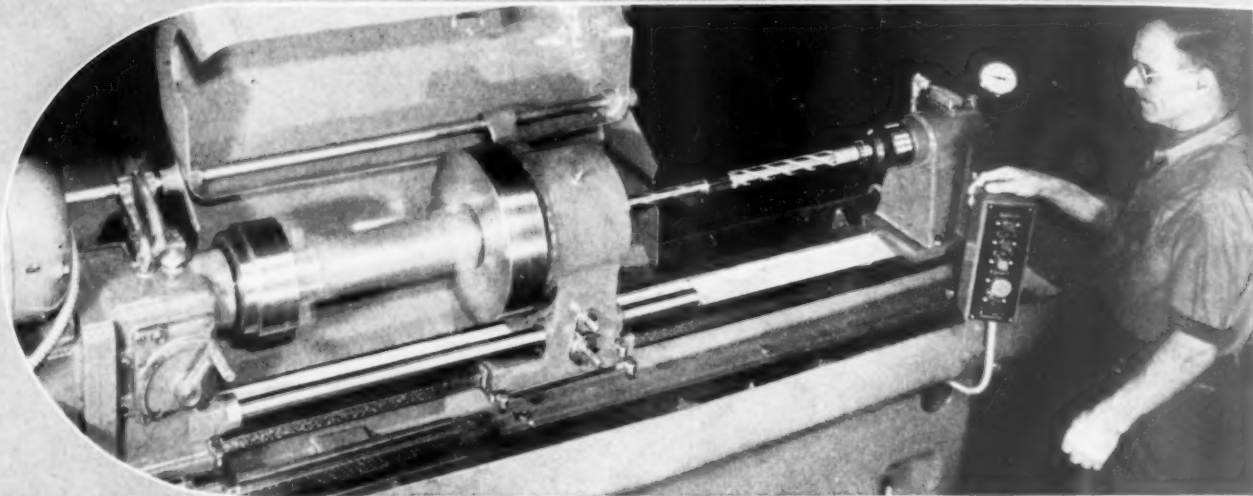
Hollow shafts up to 47" long—used in aircraft engines, tank engine components, and gun components.



Impeller shafts, gear blanks, hollow gear clusters etc.—used in aircraft and tank engine components, gun mounts, etc. Max. 20" outside diameter.

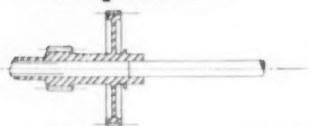


Non-symmetrical parts (Gun Components Etc.) requiring deep hole drilling are accommodated through the use of cradle-type fixtures.

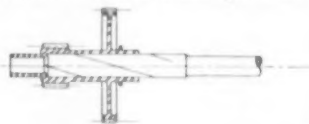


First experimental model of our No. 410 single spindle deep hole drilling machine. The machine is shown while taking test reaming cuts on two different diameters simultaneously. Below is shown the new improved 9 speed No. 410 drilling machine.

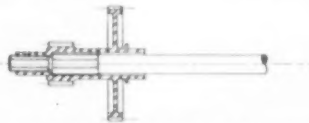
### Typical Operation Sequence



1st Operation: Rifle drilling straight through from solid. Stock left for removal in second operation is .487".



2nd Operation: Re-drill or core drilling operation to predetermined depth. Stock left for finish reaming is .015".



3rd Operation: Finish ream 2 different diameters. Approximately one minute is used for loading and unloading in each operation (done in lots). Total production is approximately 3 pieces per hour.

**W.F. & JOHN  
BARNES**

ROCKFORD  
ILLINOIS

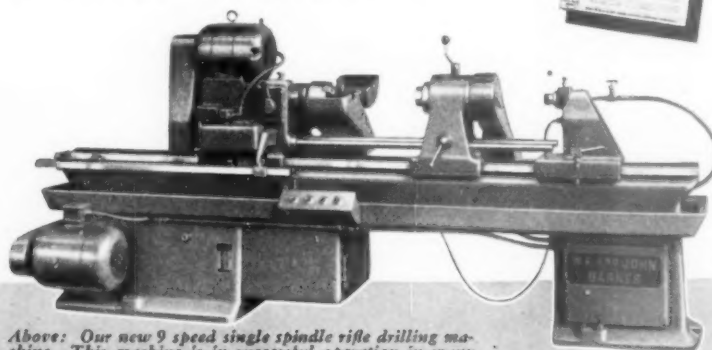
### IMPROVE FINISH-DRILL STRAIGHTER HOLES- LOWER TOOL MAINTENANCE COSTS

This new machine has been designed and developed especially for rifle drilling odd parts common to many divisions of ordnance and aircraft work.

Rough reaming operations are often eliminated due to superior finish obtained with single-flipped rifle drills. These drills are also capable of drilling straighter holes than possible with conventional drills. The machine is equipped with torque overload for tool protection and a high pressure coolant system. Both contribute to better production and lower tool maintenance costs. This machine can be tooled for drilling from solid, core-drilling, reaming and counterboring operations.

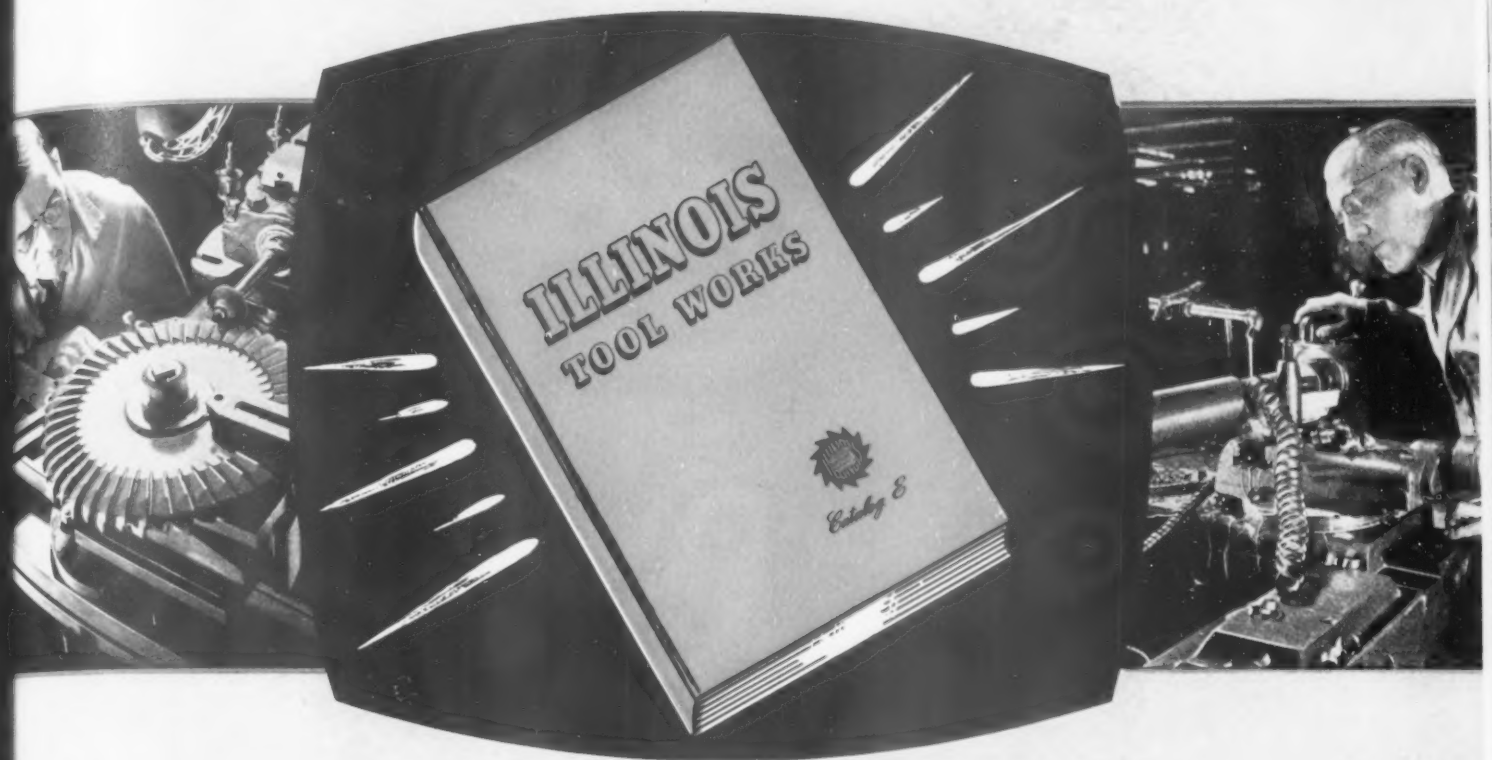
**CAPACITY:** Furnished in strokes of 24"—36" or 48" maximum. Nine spindle speeds (91 to 1347) are provided, powered with a 5 HP motor. Drilling from solid 1 1/4" dia. max.

**FREE RIFLE DRILLING DATA:** Complete specifications will be sent upon request. In addition, write for the 420 bulletin covering deep hole drilling and boring operations of larger parts such as gun barrels. Ask for bulletins TES-410 and TE-3-420.



Above: Our new 9 speed single spindle rifle drilling machine. This machine is in successful operation in many plants manufacturing parts similar to those shown above.

# Did you get Your Copy?



"One of the most unique and complete works of its kind I have ever seen."

"Furnishes a wealth of information to those concerned in a technical way with the use of tools."

"Have given orders that your catalog be read by all the executives of our plant."

## Comprehensive Engineering Handbook on High Speed Production Tools!

If you did not see our initial announcement of this 292 page reference book, you are invited to send for a copy. Leading tool designers, buyers and production men who daily refer to Catalog E state that it contains more useful engineering data than other similar publications.

Graphically illustrated with easily understood, explanatory drawings, this handbook summarizes more than a quarter century of ILLINOIS TOOL experience in producing precision metal cutting tools.

Catalog E is offered without charge to engineers, production men and tool buyers sending in a request on their company letterhead.

"An outstanding publication... the engineering data is by far the best that has been presented in similar form."

"Arranged and indexed so as to enable the reader to get information from it quickly."

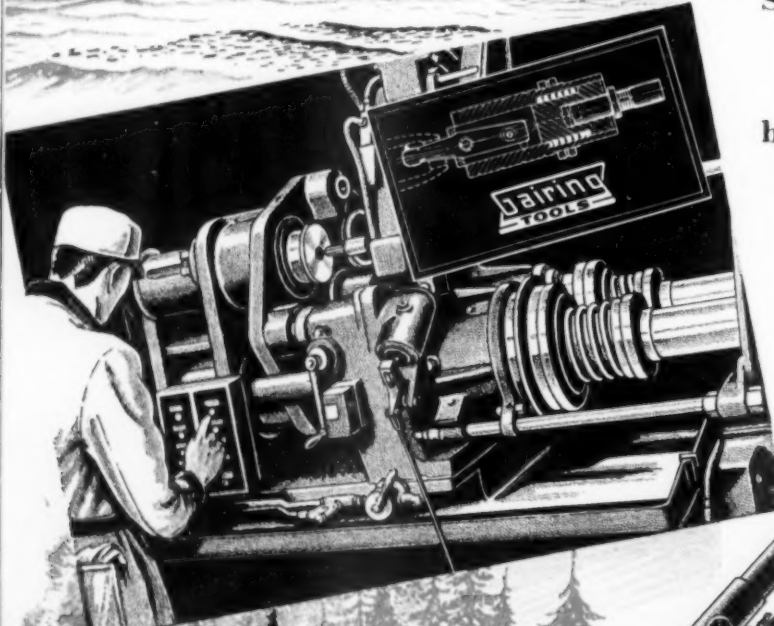
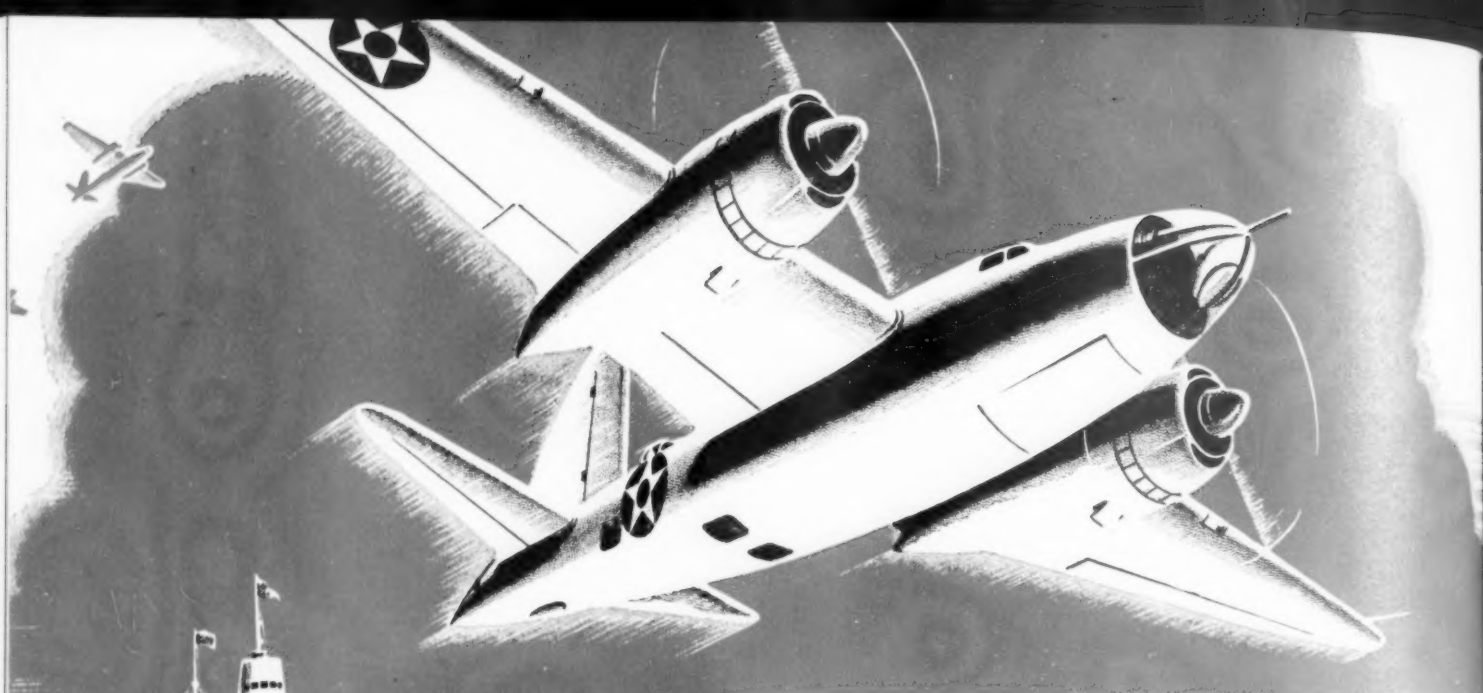
"The most complete information on correct design, selection and use of metal cutting tools."

Manufacturers of  
**ILLINOIS**  
High Speed  
Production Tools  
and  
**SHAKEPROOF**  
Products

# ILLINOIS TOOL WORKS

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IN CANADA: CANADA ILLINOIS TOOLS, LTD., TORONTO, ONT.

Hobs... Broaches...  
Gear Shaper Cutters  
... Milling Cutters...  
Metal Slitting Saws  
Gear Measuring Blocks  
Special Tools  
...  
Gear Measuring  
Machines  
Die Filing Machines



## *From the Arsenals of Victory*

This is a war of production.  
 To keep a constant stream of arms flowing  
 from the arsenals of Democracy, every  
 manufacturing plant must be geared for  
 speedy, efficient, "all-out" production.  
 Operations must be swift and accurate  
 —rejects must be minimized—  
 the stream must be uninterrupted.  
 Supplying cutting tools for the manufacture  
 of a wide range of war implements—  
 that's a job Gairing is fitted to do  
 by 25 years of specializing in the design  
 and manufacture of standard, special and  
 Gair-Lock Inserted Blade Cutting Tools.

**THE GAIRING TOOL COMPANY**

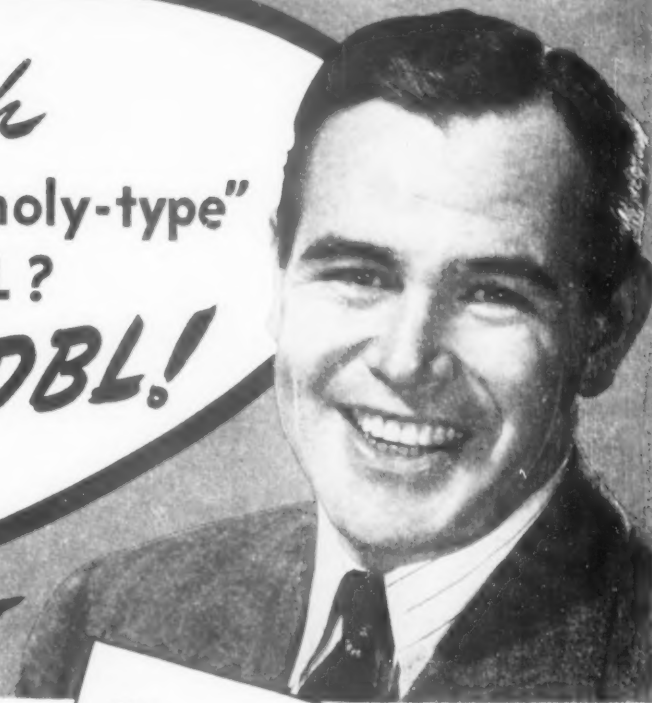
Detroit, Michigan



**GAIRING**  
 FOR A  
 QUARTER CENTURY  
 SPECIALISTS  
 IN FINE  
 CUTTING TOOLS

*Which*  
 "low-tungsten" or "moly-type"  
 HIGH SPEED STEEL?

*That's easy... DBL!*



**STANDARDIZE** on this  
 analysis...it identifies  
 DBL High Speed Steel

C	.75— .85
Cr	3.50—4.50
W	5.00—6.00
Mo	4.00—5.00
V	1.25—1.75

For "moly-type" cutting steels,  
 or for working out solutions  
 to your plant tooling problems,  
 our Mill Service Staff is at  
 your disposal. • Just write us.

### Get these **ADVANTAGES**

- ★ DBL meets government tungsten conservation requirements; it contains less than  $\frac{1}{4}$  as much tungsten as 18-4-1.
- ★ It matches or out-performs 18-4-1 in nine out of ten cases.
- ★ It heat-treats virtually the same as 18-4-1; requires no coating during hardening; does not de-carburize. No new equipment or methods are needed.
- ★ DBL weighs 8% less than 18-4-1; you get more tools per pound of steel.
- ★ Free patent license is offered, without time limit or other restrictions.

**ALLEGHENY LUDLUM**

STEEL CORPORATION

PITTSBURGH, PA.

*Tool Steel Division*



*Watervliet, N. Y.*

Allegheny Ludlum Steel Corporation  
 Oliver Building, Pittsburgh, Penna.

T218

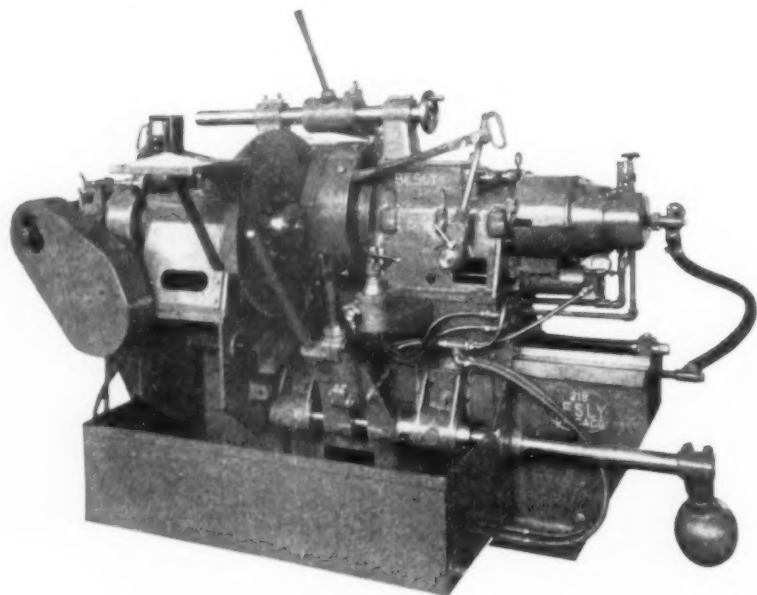
Send me a copy of the "DBL Blue Sheet."

NAME \_\_\_\_\_

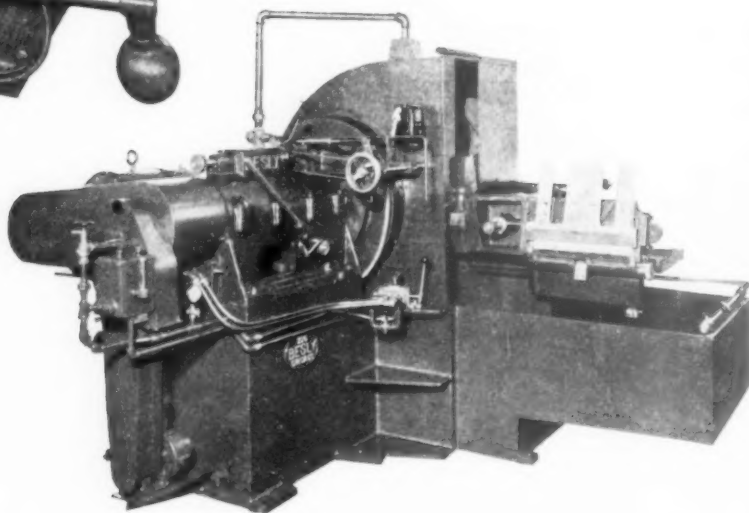
COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

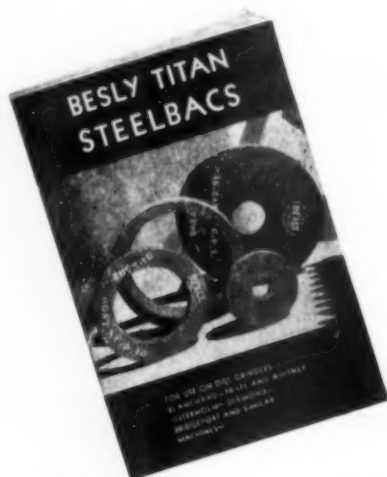
**From the House of BESLY** comes an array of Grinding Machines for specific and general purpose. Illustrations give you some idea of the versatility of Besly Engineers.



No. 218—23" Wet Besly Double Spindle with Rotary Feeding Fixture for large runs of comparatively small pieces and Hand Operated Swinging Fixture for larger pieces handled in small lots.



No. 226—30" Wet Single Spindle Besly Grinder with Combination Hydraulic and Ratchet Feed on wheel spindle carrying 30" x 22" x 2" Besly Titan Steelbac Abrasive Disc served by Hydraulic Travelling Table. Fixture—Double End Indexing Type holds 16" wide tobacco knives ground at the rate of sixty pieces per hour. Write for No. 219-A Bulletin describing many other interesting Besly Grinder developments. **Why not investigate the possibility of Besly grinding your flat surfaces?**



**[[ Write for your copy of Booklet  
on Besly Titan Steelbacs ]]**

If you operate a Blanchard, Pratt & Whitney, Diamond, Osterholm, Bridgeport or similar machine you should be using Besly Titan Steelbac Abrasive Wheels. Buy grinding members for Disc Grinders from the leader.

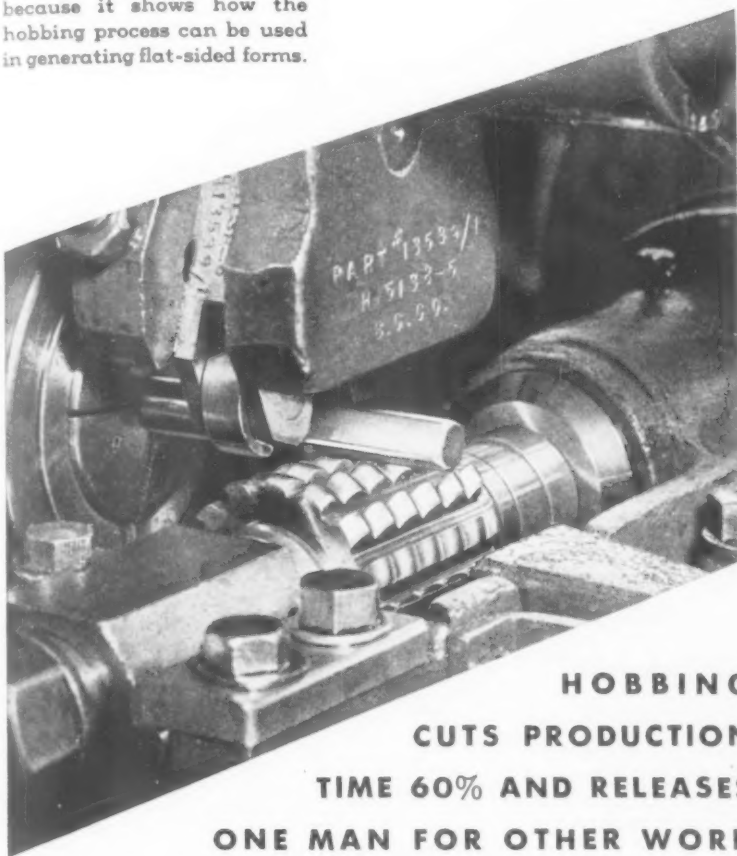
**CHARLES H. BESLY AND COMPANY**  
118-124 NORTH CLINTON STREET ★ CHICAGO, ILLINOIS

THE TOOL ENGINEER

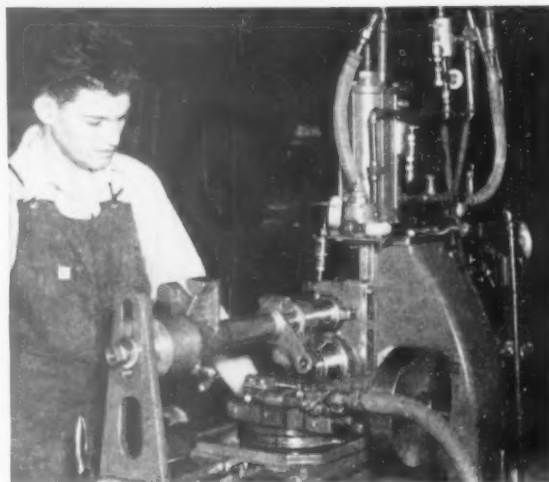
These square-end pieces are the main drive shafts used in one of the best known makes of outboard motors. The square end carries the full load of the driving power and consequently must have a close sliding fit so that it will not become deformed under the alternating stresses generated by the engine. The job is particularly interesting because it shows how the hobbing process can be used in generating flat-sided forms.



## SQUARE SHAFT ENDS HOBBED 400 PER DAY



**HOBGING  
CUTS PRODUCTION  
TIME 60% AND RELEASES  
ONE MAN FOR OTHER WORK**



### PRODUCTION DATA

Part — Outboard Motor Drive Shaft.

Material — Hyten No. 38 H.R. Steel (Hardened).

Operation — Hobbing square end of drive shaft;  $1\frac{1}{8}$ " long; .3715" square.

Hobbing Machine — Barber-Colman No. 3.

Hob Data — B-C Ground, non-topping 2" x 2" x  $\frac{3}{4}$ " straight bore; single thread; 15 gash.

Hob Speed — 133 r.p.m.

Feed Per Rev. of Work — .045".

Pieces per grind — 490.

Production Time — 1.06 min. Floor-to-Floor. 400 average in 8 hour day.

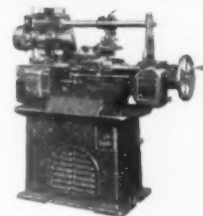
Hob Life — 27 sharpenings, or approximately 13,230 shafts.

THESE shafts were formerly straddle milled, and a following operation on a second machine cut a keyway in the opposite end of the shaft. This required two operators. Now, with a B-C No. 3 Hobbing Machine in place of the first milling machine, production time on the square end was cut 60%, and one man handles *both* operations. An operator and a milling machine, badly needed on other work, were released. Note that the hobbing machine has a hydraulic cylinder on the work slide to reduce work change time to a minimum, and a roller steady-rest on the work close to the cutting point.

### B-C NO. 3 HOBGING MACHINE USEFUL FOR EITHER SMALL LOTS OR HIGH PRODUCTION JOBS

Designed for hobbing a wide variety of work up to 5" in diameter by 7" face, the B-C No. 3 Hobbing Machine provides every facility for rapid, accurate hobbing and easy operation. It is quickly and easily set up for either

short run or high production work. Many special units can be incorporated when required, and add to its flexibility and adaptability. This square shaft job is only one of many instances of special applications.



Ask for Bulletin 812-4 covering the No. 3 Hobbing Machine and Bulletin 1410-1 on Special Units and Accessories.

**BARBER  
B-C**

**COLMAN  
PRODUCTS**

**HOB, HOBGING  
MACHINES, HOB  
SHARPENING MA-  
CHINES, REAMERS,  
REAMER SHARP-  
ENING MACHINES,  
MILLING CUTTERS,  
SPECIAL TOOLS**

# BARBER-COLMAN COMPANY

General Offices and Plant 213 Loomis Street, Rockford, Illinois, U. S. A.

# How to speed up production in your tool room



THE regular grinding and conditioning of rapidly increasing numbers of tools and dies is a task that is severely taxing the tool rooms of industry. If this is a problem in *your* plant, here are two simple steps you can take to speed up work in your tool room:

## 1 MAKE SURE YOU ARE USING THE RIGHT GRINDING WHEEL FOR EVERY JOB . . .

*Carborundum can supply you with wheels that are exactly suited to each grinding operation . . . wheels of exactly the right grain, grit, grade, bond, shape and size.*

Carborundum has available and will help you select exactly the right wheels for each tool room job . . . wheels developed in the great Carborundum research laboratories and manufactured with the background of fifty years' experience . . . wheels that assure you unusually rapid production with the necessary close tolerances and fine finishes. Three Aloxite Brand Aluminum Oxide Wheels have been especially designed for grinding steel tools and dies . . . the "AA" white wheel and the "600 Bond" red wheel for all-purpose tool room jobs, and the "200 Bond" blue wheel for production work on duplicate pieces. Whatever grit, grade or shape you need, you can depend on these wheels to cut fast with light pressures . . . to produce the desired finishes and close tolerances . . . to cut cool.

The Carborundum Brand Diamond Wheel, in conjunction with the famous Carborundum Brand Silicon Carbide "Green-Grit" Wheel (for roughing) condi-

tions cemented carbide tools faster, better and more economically than was ever before thought possible. The rate of stock removal is amazingly high and you save time, too, because sharp smooth edges are obtained directly from the diamond wheel without the necessity of lapping.

Aloxite Brand Aluminum Oxide Mounted Wheels can do many jobs quicker and better . . . removal of surplus stock on dies and moulds . . . final finishing of dies and moulds . . . forming of teeth of special cutters . . . sharpening of small tools.

## 2 MAKE SURE YOUR GRINDING SET-UP ON EVERY JOB IS EXACTLY RIGHT!

*If advisable or necessary, Carborundum Engineers will be glad to work with you to see to it that you realize the full benefits of Carborundum-made wheels.*

In addition to furnishing you wheels properly specified for each individual job, Carborundum Engineers will, if you desire, come right into your tool room, check your grinding conditions and make sure you are taking full advantage of the possibilities of Carborundum-made grinding wheels. They frequently are able to point out better methods or short cuts that lead at once to higher production and improved quality. Why not get in touch with our nearest office for complete information or send for booklet on recommended Tool Room Gradings, Form A-926.

**CARBORUNDUM**

ABRASIVE PRODUCTS

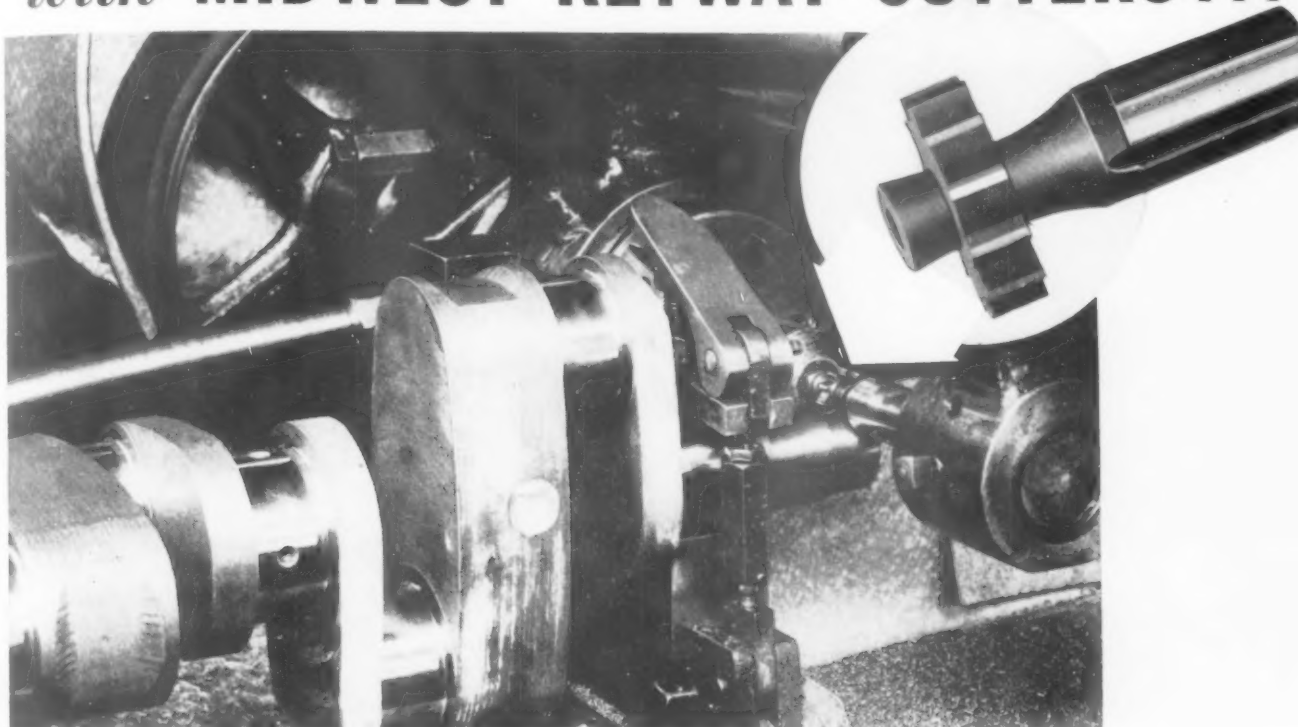


**THE CARBORUNDUM COMPANY • NIAGARA FALLS, N. Y.**

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

(Carborundum and Aloxite are registered trade-marks of and indicate manufacture by The Carborundum Company)

# You can take heavier cuts at Faster Speeds with **MIDWEST KEYWAY CUTTERS...**



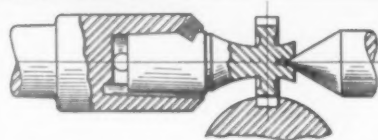
Here are **3** important reasons *why*—

**1—SUPPORTED AT BOTH ENDS**—the cutter is made with an extended center which provides a support for it at the outer end, thus both ends of the cutter are supported, giving absolute rigidity to the operation.

**2—THE POSITIVE DRIVE**—Midwest Cutters have a stub taper shank with a groove to fit a pin that is partly embedded in the wall of Midwest patented Taper and Pin Drive Holders. Full driving energy is exerted along the entire length of the shank, giving the cutter absolute rigidity and perfect alignment. No parts easily dislocated or lost are employed.

**3—SCREW LOCKED**—the cutter shank is designed for positive locking to the holder by a lock-screw which bears against the angular flat on the shank of the cutter. Cutter vibration is eliminated.

**MIDWEST TOOL & MFG. CO.**  
2364 W. Jefferson Ave. • Detroit, Mich.



This sectional view of a Midwest Keyway Cutter set-up shows the Extended Center which provides an outer support for the cutter; the Taper and Pin Drive; and the Screw-Lock between the cutter shank and holder.

END MILLS • SLEEVES • COUNTERBORES • DRILLS • SPECIAL TOOLS  
REAMERS • FORM TOOLS • CARBIDE TIPPED TOOLS • ADJUSTABLE HOLDERS



*Precision* **METAL CUTTING TOOLS**

# CP WRENCHES SAVE THOUSANDS OF MAN HOURS

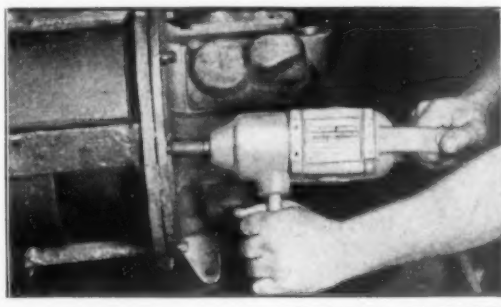
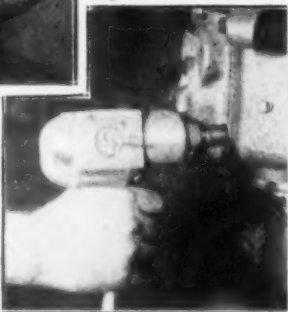


↑ **ASSEMBLY TIME ON THIS PRODUCT** was reduced materially by the use of this CP 349-RP Pneumatic Wrench (impact type). All CP Pneumatic Wrenches are simple in design and sturdily built. Slow speed rotary motors, absence of springs and gears in the driving unit and a minimum number of parts insure low maintenance.



**ONLY 6-5/8" LONG** and weighing only 4 1/2 pounds, CP 344-RS is a midget among pneumatic wrenches—but a speedy, powerful tool that handles nuts up to 3/8" bolt size. Can also be used for lag screws, studs. ↓

↑ **FOR NUTS, BOLTS, etc., up to 3/4" bolt size,** the CP 360-RS has no superior. In assembly work and in maintenance jobs requiring nut removal or applications, the CP 360-RS wrench quickly pays for itself.



↑ **FOR RUNNING NUTS ON** or backing them off, for the application or removal of bolts, studs, lag screws, etc., there is nothing faster or easier to handle than the CP 349-RP. Has exceptional speed and power for a wrench of its size. Handles nuts, etc. up to 5/8" bolt size.

## SPEED APPLICATION, REMOVAL OF NUTS, BOLTS, LAG SCREWS

Six Models, Handling Up to 1 3/4" Bolt Size

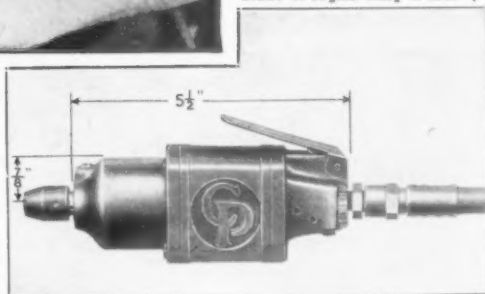
NEW YORK—On production lines, in assembly work and in many types of plant maintenance requiring application or removal of nuts, bolts, studs, lag screws, etc., CP Pneumatic Wrenches (impact type) are saving thousands of man hours. Speedy, powerful, these CP wrenches will run a nut, bolt, stud or lag screw on or off in the wink of an eye. Light, properly balanced, they can be handled for long periods without undue fatigue. Simple in design and ruggedly built, they stand up under hard service with a minimum of maintenance cost.

In addition to the four models shown on this page there are two larger wrenches, CP 365-R for nuts, bolts, screws, etc., up to 1 1/4" and the CP 375-R handling up to 1 3/4" bolt size. Complete information on request.

**CHICAGO PNEUMATIC**  
TOOL COMPANY

General Offices: 8 E. 44th St., New York, N. Y.

**SMALLEST, LIGHTEST** of all impact wrenches, CP 337-RS is brand new. While developed originally for the airplane industry, it has wide adaptability for all types of light nut running, particularly for applications in close quarters. Handles nuts up to 1/4" bolt size. Weighs only 2 lbs. ↓



CHICAGO



PNEUMATIC

## PNEUMATIC TOOLS

**ALSO: Air Compressors, Electric Tools, Rock Drills, Hydraulic Aviation Accessories, Diesel Engines**

WRENCHES  
DRILLS  
REAMERS  
RIVETERS  
CHIPPERS  
GRINDERS

# JARVIS

## POWER TOOLS



Jarvis Tappers are available in a complete range of sizes up to 2" capacity. Friction as well as positive types according to your requirements.

**THE CHARLES L. JARVIS  
COMPANY**

MIDDLETOWN, CONN.

## SOME USERS OF TURNER UNI-DRIVE

American Brake Shoe & F. Co.  
Kellogg Division  
Southern Wheel Division  
Augusta Arsenal  
Bendix Aviation Corp.  
Burgess Battery Corp.  
Cessna Aircraft Corp.  
Chicago, Rock Island &  
Pacific R. R. Co.  
Chicago Screw Company  
Combustion Engineering Co.  
Doehler Die Casting Co.  
Electric Auto-Lite Co.  
Frankfort Arsenal  
Frisco Lines  
Hartzell Industries  
Imperial Brass Mfg. Co.  
International Projector Co.  
Kohler Corp.  
Koppers Corporation  
Monsanto Chemical Co.  
The New York Air Brake Co.  
Ohio Pattern and Fdry. Co.  
Oneida, Ltd.  
Perth Amboy Dry Dock Co.  
Republic Steel Corporation  
Revere Copper and Brass, Inc.  
SKF Industries  
The Timken-Detroit Axle Co.  
The Todd Company  
Wagner Electric Co.  
Sullivan Dry Dock Co.



## Motorize Your Machine Tools Quickly This Way

The old way is too slow today. More speed...greater production...you must have them to keep apace! Enlist the aid of TURNER UNI-DRIVES. They'll increase production like an extra shift...save time...speed up work...keep down power costs. They're doing it in scores of shops and plants. They'll do it in yours. TURNER UNI-DRIVE is the *successful* one motor drive.

Easily and quickly installed. They do away with overhead counter shifts...no belts to shift. Increase the efficiency of machine and operator. Drive on large cone at all speeds. One trial will thoroughly convince you.

Right now — today...investigate TURNER UNI-DRIVE. See your dealer, or write or wire us for full information.

### THE TURNER UNI-DRIVE COMPANY

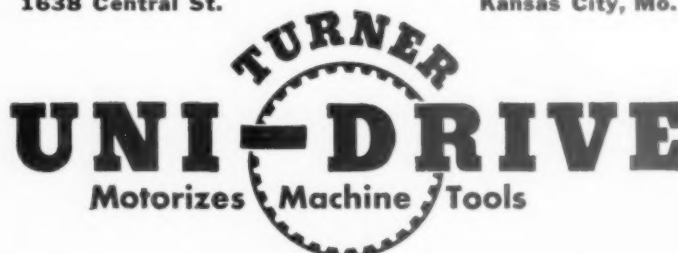
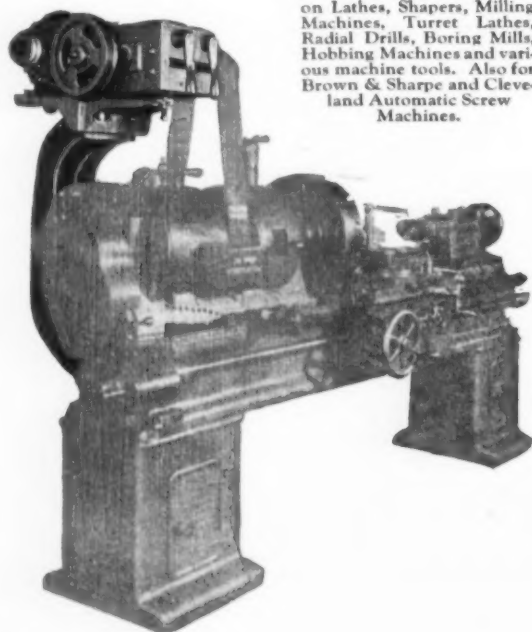
(Sales Division: Turner Machinery Co.)

1638 Central St.

Kansas City, Mo.

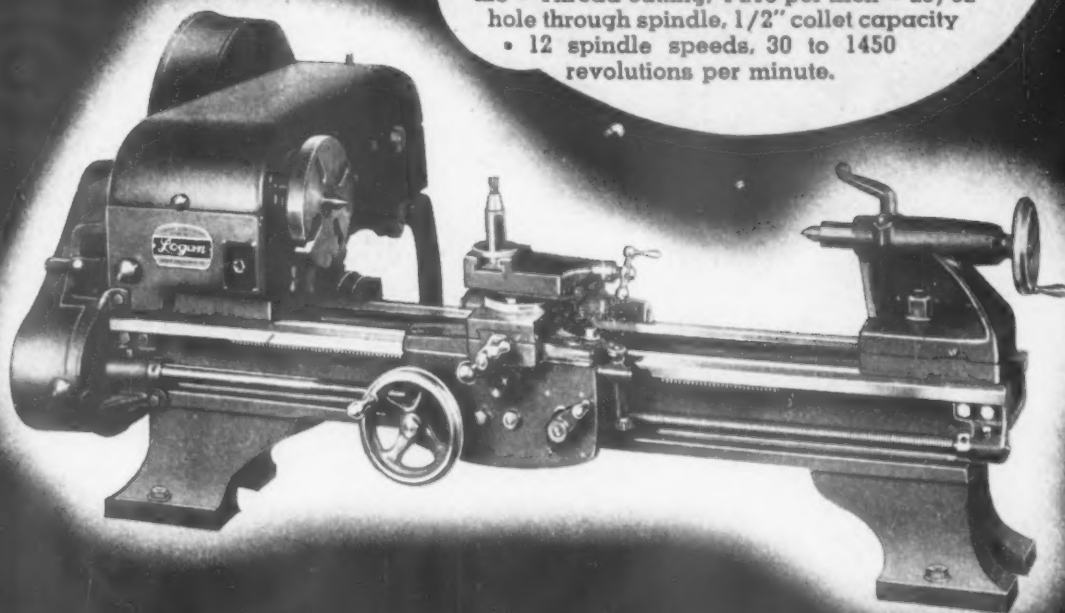
### IT DOES THE JOB

on Lathes, Shapers, Milling Machines, Turret Lathes, Radial Drills, Boring Mills, Hobbing Machines and various machine tools. Also for Brown & Sharpe and Cleveland Automatic Screw Machines.



## BRIEF SPECIFICATIONS

10" swing; 24" between centers • Bed 6 15/16" wide by 43 1/8" long • Prismatic V and flat ways, hand scraped and honed • New Departure precision pre-loaded ball bearing headstock spindle • Thread cutting, 4-216 per inch • 25/32" hole through spindle, 1/2" collet capacity • 12 spindle speeds, 30 to 1450 revolutions per minute.



NO. 210 LOGAN BENCH MODEL BACK GEARED SCREW CUTTING LATHE ALSO FURNISHED IN FLOOR MODEL, NO. 200

## THERE IS ADDED VALUE IN A LOGAN LATHE

The Logan is primarily a good production tool built for the machine shop, requiring a rugged lathe of sustained accuracy. It brings many features heretofore incorporated only in larger equipment. The use of ball bearings in the headstock and a patented countershaft assembly — rubber mounted, with three point suspension and fully guarded, will definitely appeal to a production minded shop man.

LOGAN ENGINEERING COMPANY • Chicago, Illinois

*Logan*

A NAME TO REMEMBER WHEN YOU THINK OF LATHES



# *Speed* TO YOUR DEFENSE PRODUCTION OBJECTIVES

**Type 'G'  
Self-Opening  
Die Head**



**Type 'M'  
Collapsible  
Tap**



Murchey Taps and Die Heads are enabling defense industries to reach their objectives in record time—to produce accurately threaded parts rapidly and with minimum down time for resharpening an adjustment.

Murchey equipment is producing threads to Class 3 fits in aircraft parts such as landing gear struts, doing threading jobs on tough materials for army trucks, tapping and chamfering the nose of shells and bombs and performing hundreds of other important defense assignments.

Let Murchey experience—concentrated in the field of thread production—help you to speed to your defense production objectives. Write for our suggestions on your particular problems.

**We also manufacture a complete  
line of Thread Milling Machines  
and Shell Tapping Machines.**

# MURCHEY

## MACHINE & TOOL COMPANY

151 PORTER STREET

DETROIT, MICH.

# ON THE MARCH to aid users of alloys...

**FIELD** offices are maintained by International Nickel's Development and Research Division and by qualified distributors. Nickel field representatives are always on the go. These men offer practical advice about selection, fabrication and uses of metals. Assistance is likewise offered on problems arising from the diversion of Nickel to war industries.

Also available are many useful publications for the information of alloy users to serve as practical guides for new employees and for men performing new operations.

For a check list of available published information or a quick personal answer to your specific questions about Nickel alloys, please address:



## NICKEL

**THE INTERNATIONAL NICKEL COMPANY, INC.** 67 WALL STREET  
NEW YORK, N. Y.

MARCH, 1942



**(LOOK!  
PARK  
BUILT A BETTER  
RAT TRAP**

# DO YOU Carburize?

do YOU *want to cut carburizing costs?*

## HERE'S HOW..

1. PARK NON-BURNING COMPOUND IS AN ENERGIZED PULVERIZED COAL WHICH IS COKED, CRUSHED AND SCREENED. IN *this* treatment, energizer is distributed *throughout entire* coke granule rather than on surface.
2. N/B Compound can be used over again as high as *twenty times* without fresh additions, and continues to give high carbon "Cases".
3. Normal fresh additions *can* be as high as 15/1 ratio, compared to other compounds which require 3/1 mixture.
4. N/B contains *no* charcoal to continue burning after withdrawal from hot furnace.
5. Cumulative shrinkage after *twenty heats* with no fresh additions only amounts to 50%, compared to 25% on *first heat* with other type compounds.
6. N/B weight per cubic foot equals 25 pounds. Compound is purchased by ton, but used by cubic foot. In every ton of N/B you receive 80 cubic feet, compared to approximately 65 cubic feet with others.

A Real Advance in Carburizing Practice

Heat Treating

**Park**

SAMPLES OR LITERATURE  
AVAILABLE

Products Since 1911

**CHEMICAL COMPANY**  
8076 MILITARY AVENUE DETROIT, MICHIGAN.

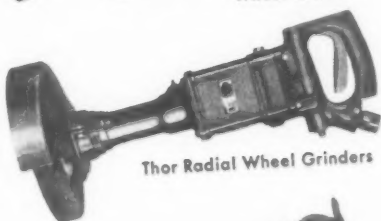


**YOU'LL  
waste no time  
ON GRINDING . . .**

**50 Thor Air Grinders  
For Every Type Of Job!**



Thor Small  
Wheel Grinders



Thor Radial Wheel Grinders



Thor Wire Brushes



Thor Rod Grinders

**LOOK AT THE RANGE!**

Number of Models . . . . . 50  
Wheel Capacities 1½" to 8" dia.  
Speeds . . . . . 3000 to 21,000 RPM  
Lengths . . . . . 5½" to 39"  
Weights . . . . . 18 oz. to 24 lbs.

**with These Powerful  
THOR AIR GRINDERS**

To give you top speed for peak production grinding . . . to give you precisely the type of power, light weight, and extreme stamina that make it possible, THOR Air Grinders have these advanced construction features:

1. THOR "Air Behind the Blades" principle keeps the rotor blades out against the cylinder bushing wall, preventing dead center position and assuring *instant starting* under all operating conditions.
2. The solid one piece construction of the THOR rotor permits the use of deeper blade slots and wider blades. This greatly boosts the power and the rate of material removal.
3. The THOR Double-Acting Safety Governor acts to save time in two ways: It regulates spindle speed to the level of highest grinding efficiency for the size and type of wheel used. It prevents racing of wheels at dangerously high speeds even in event of mechanical failure of governor parts.

You will find these top speed construction features, plus others like THOR End Exhaust, Automatic Lubrication, and Labyrinth Seal on Spindle, in a complete line of THOR Air Grinders for every industrial application. For details, write for THOR Pneumatic Catalog No. 52A.

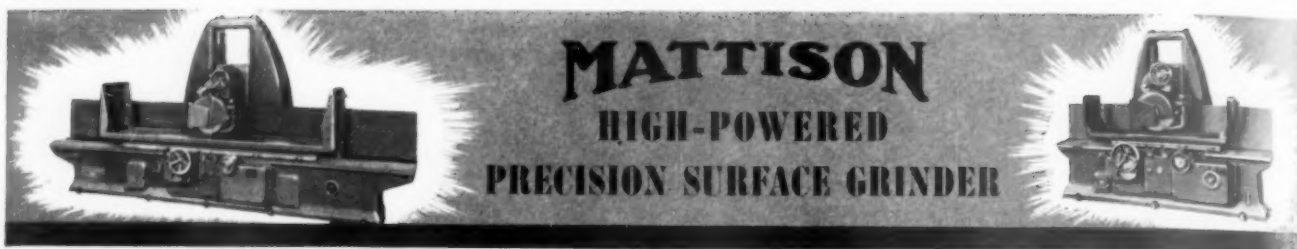
*Thor*

Portable Pneumatic and Electric Tools

**INDEPENDENT PNEUMATIC TOOL COMPANY**



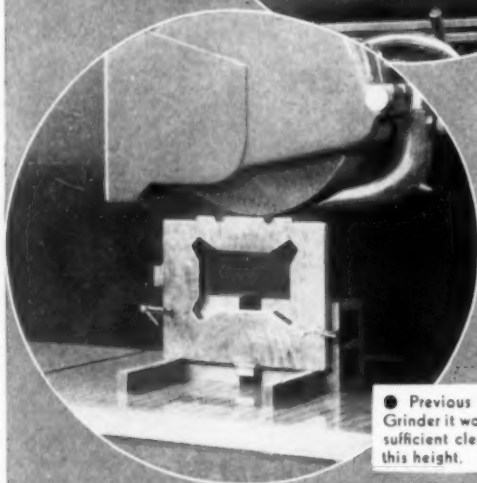
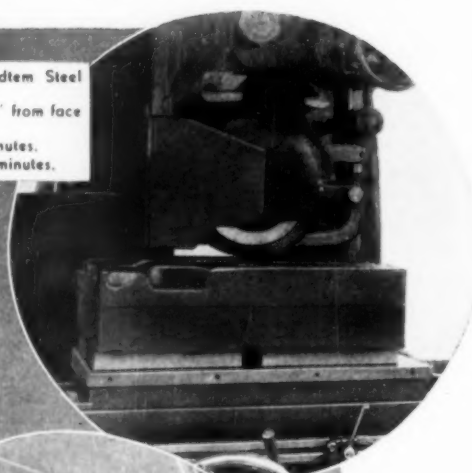
600 W. JACKSON BOULEVARD, CHICAGO, ILL.  
Branches in Principal Cities



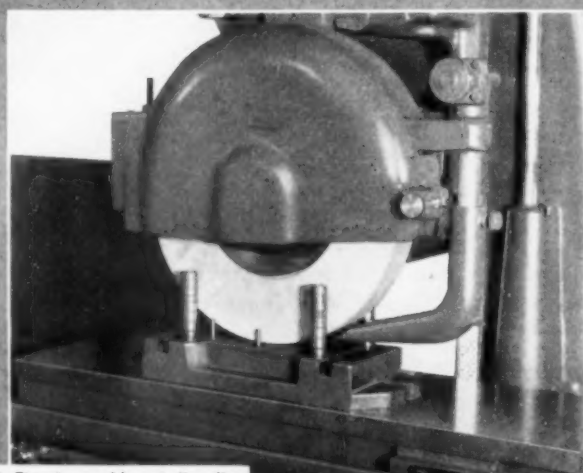
# MATTISON HIGH-POWERED PRECISION SURFACE GRINDER

## 'Time Out' DIE RECONDITIONING HELD TO A MINIMUM

● Material: Hardtem Steel  
Forging die.  
Stock Removed:  $\frac{1}{4}$ " from face  
side.  
Present Time: 8 minutes.  
Previous Time: 30 minutes.



● Previous to obtaining Mattison  
Grinder it was not possible to obtain  
sufficient clearance to grind dies of  
this height.

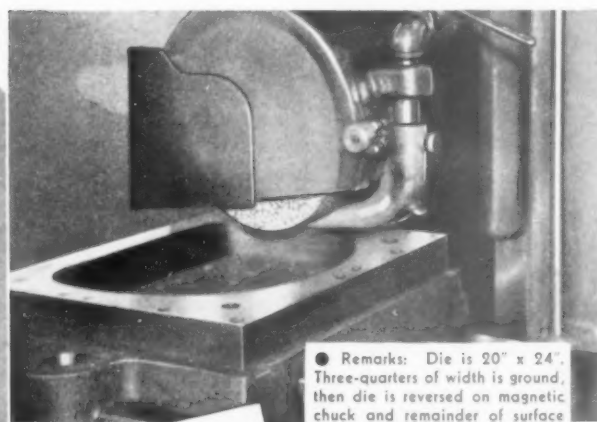


● Time is saved by grinding dies  
with leader pins in place.

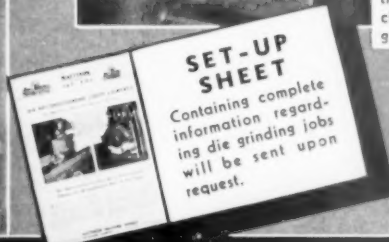
A GREAT variety of die work can be speedily and easily handled on the Mattison Surface Grinder. Its large capacity, ability to hog off stock and high power, keeps the 'time out' periods to a minimum.

A few examples of die jobs ground on the Mattison at a considerable saving in time, are shown on this page. Die shown in the lower left hand corner was ground with leader pins in place at 1/3 of former time. Wheel and spindle clearance of Mattison Grinder is sufficient to handle this type of work with ease, eliminating time required for disassembly and alignment when leader pins are removed.

For further data regarding use of Mattison Grinders for reconditioning dies, ask us to send you set-up sheets on this subject.



● Remarks: Die is 20" x 24".  
Three-quarters of width is ground,  
then die is reversed on magnetic  
chuck and remainder of surface  
ground. Time 20 minutes.



**MATTISON MACHINE WORKS, ROCKFORD, ILL., U. S. A.**



# NAVY "E"

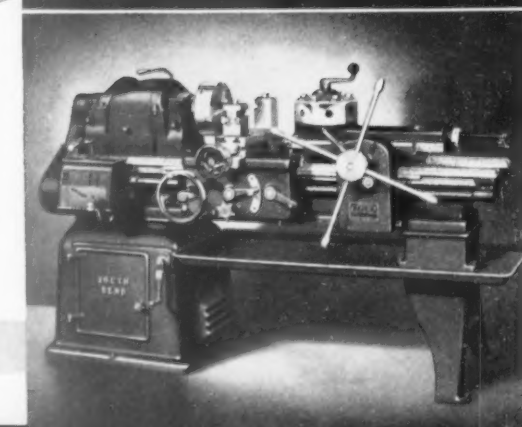
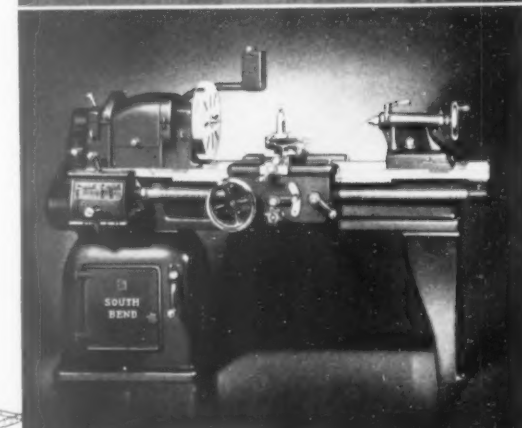
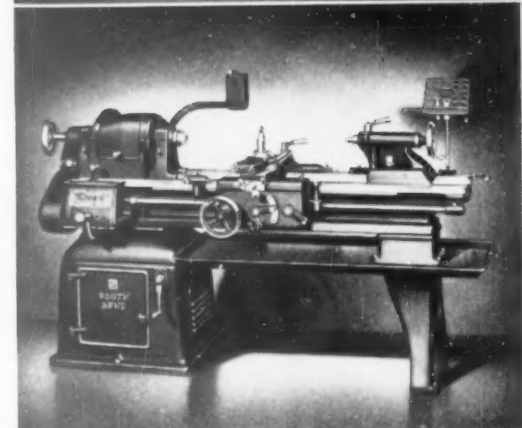
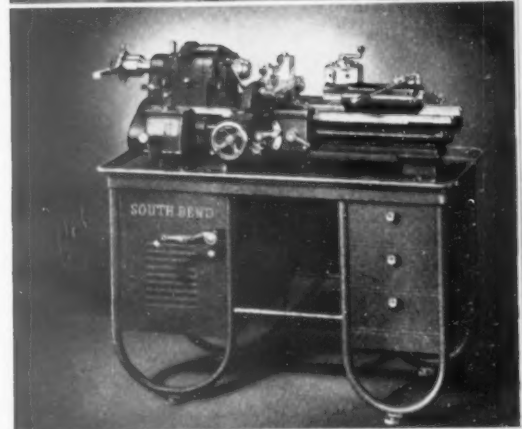
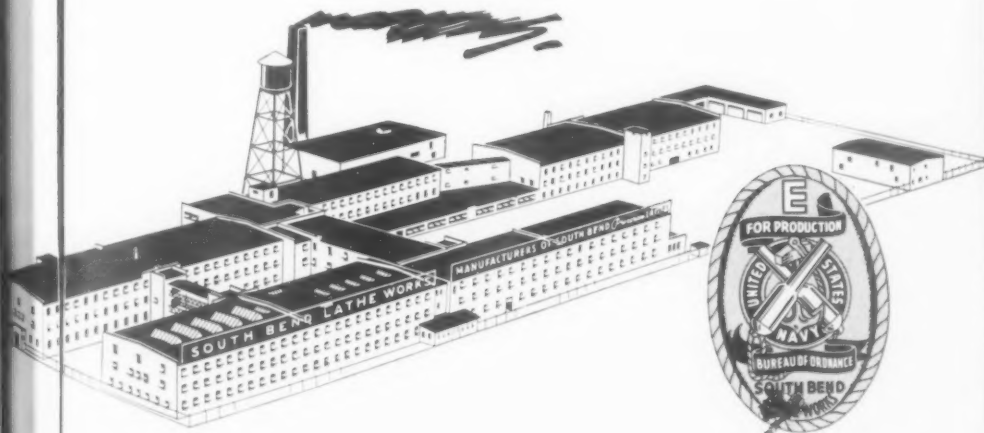
*Awarded to*

## SOUTH BEND LATHE

The Navy Ordnance Flag and "E" Pennant have been awarded to the South Bend Lathe Works for outstanding performance in the production of ordnance matériel for the United States Navy.

For years South Bend Lathes have served our Navy. More recently—since Defense demands have called for vastly increased machine tool production—South Bend has been "ahead of schedule" in the production of lathes.

Permission to fly the Navy "E" from our flagstaff and to wear the "E" on our lapels, is an honor. While these emblems serve as recognition for work well done—they also serve as a reminder of the tremendous job that lies ahead. We will do our part to help finish it.



### SOUTH BEND LATHE WORKS

478 E. Madison St., South Bend, Ind.      Lathe Builders for 35 Years

# SOMEWHERE in U.S.A. HUNDREDS OF RICKERT-SHAFER TAPPING MACHINES ARE ON SHELL WORK



OVER 25 years ago Rickert-Shafer Company pioneered the use of friction drive for hand-fed reaming, tapping, thread gauging, parts assembly and similar operations. In scores of "Somewhere in U. S. A." hundreds of Rickert-Shafer friction drive tapping machines are working for Uncle Sam. Their popularity is due to the simplicity of operation — push to tap, pull to reverse. Production speeds are easily attained and the tap or gauge is fully protected against damage by the planetary friction drive of the Rickert-Shafer method. Write for special applications to meet your production threading and thread gauging problem.

★ Many Rickert-Shafer Tapping Machines are used at above plant for Thread Gauging 75 mm., 3" A. A., 155 mm. Army and 90 mm. H. E. shells. Above photo shows thread gauging of 75 mm. M48 Fuze Thread, Major Diameter 2.0000, Pitch Diameter 1.9459, Tolerance allowed .0106 plus or minus.

SPECIALISTS IN ACCURATE THREADING

AT GUARANTEED LOW COST

## RICKERT SHAFER CO.

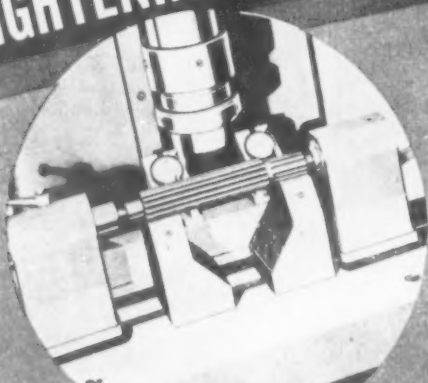
633 WEST 11TH STREET, ERIE, PA., U. S. A.



**SHOP  
TIPS**

# HOW TO RETOOL YOUR PRESENT PRESSES

*How to Get TRIPLE DUTY FROM YOUR*  
**STRAIGHTENING PRESSES**



THESE

**Free**

BULLETINS SHOW YOU  
HOW TO DO IT IN  
YOUR OWN  
SHOP

**PRESSES**



**DENISON**  
EQUIPMENT *in* APPLIED  
**HydroILics**

THE DENISON ENGINEERING CO.  
COLUMBUS, OHIO

**TO KEEP PRODUCTION MOVING WHILE  
WAITING FOR NEW EQUIPMENT!**

**TO ADAPT IDLE PRESSES TO YOUR  
CURRENT PRODUCTION NEEDS!**

You'll want these two timely bulletins. They can help you solve immediate production problems and you'll want them in your files for quick reference later on. And they're yours for the asking.

**1**

**Bulletin PH200 shows how to retool straightening presses for assembling, broaching or bending.**

**2**

**Bulletin PH201 tells how to adapt your present assembling presses for straightening or bending.**

Both are fully illustrated, descriptions are clear-cut and brief. Your own engineers can apply the suggestions almost any need you may have for special, out-of-the-ordinary press adaptations.

We hope the steady gains we are now making on our own production backlog will soon enable us to meet your needs for new equipment. In the meantime, to help you as much as possible,\* we offer you these retooling bulletins, to speed up your production. Your request will bring copies by return mail.

*The* **DENISON** *Engineering Company*  
115 W. CHESTNUT ST. COLUMBUS, OHIO

\* Denison representatives and engineers will be glad to help you with any oil hydraulic problem. A lot of interesting new uses and adaptations for oil hydraulic equipment have been developed in Denison HydroILics . . . You'll find them well worth knowing about. Write for new bulletins showing HydroILics at work. No Obligation, of course.

*Write*  
**TODAY**  
**OR YOUR COPIES**

**DENISON**  
EQUIPMENT *in* APPLIED  
**HydroILics**



**IT IS  
PERFORMANCE  
THAT  
COUNTS  
IN  
TODAY'S  
PRODUCTION  
BATTLE**

... —

**FOR VICTORY ... —**

**and the metal-working Industry... —**

The WINTER BROTHERS COMPANY is utilizing every man and machine to produce QUALITY TAPS in ever-increasing volume; without sacrificing that vital factor which has built their popularity—**ACCURACY.**

**WINTER TAPS are precision tools—handle them carefully for maximum production.**

A DIVISION  
of the  
**NATIONAL TWIST DRILL  
& TOOL CO.**  
DETROIT, MICHIGAN

**Winter Brothers**  
COMPANY  
Wrentham, Massachusetts, U. S. A.  
Branch Factory: Detroit, Michigan





**We've been saying  
this for years and**

**we say it again**

*B*arnes Service Molybdenum Hack Saw Blades have no superiors on all around production work. Their performance is unexcelled on such materials as stainless steels, chrome, nickel, vanadium and alloys. Many blade users have appreciated this fact since Service blades were first introduced. Many others, under the war time restrictions on high speed steel blades, are just now making the profitable discovery — on the basis of *cost per cut*, you can't beat the Barnes Service Molybdenum. Available in hand and power blades.

Just TRY this blade! . . . Sold throughout the United States by industrial distributors whose service to industry we respect and value.



*"Keep them rolling, keep them flying, keep Democracy from dying"*

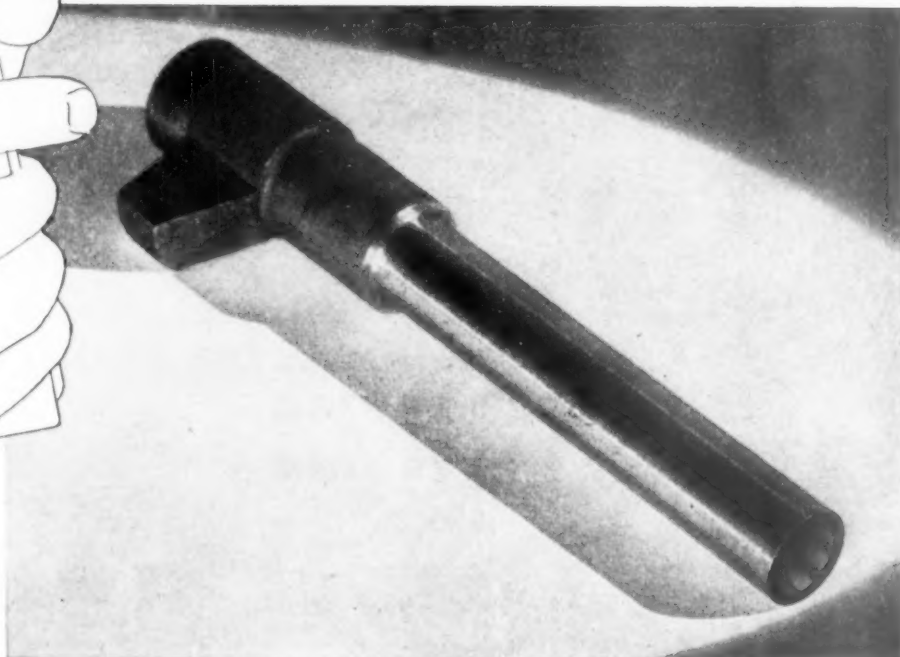
—USED BY PERMISSION OF PEARSON AND ALLEN, WASHINGTON MERRY-GO-ROUND

# THE AXIS FACES

## *Broached* PISTOL BORES



In the broaching of this part, the finishing of the bore including rifling is completed with Detroit Broaches.



With the steadily increasing volume of production of small arms, broaching is playing a vitally important role in reducing the time required for many cutting operations. In the finishing of pistol bores, for instance, Detroit Broaches are in constant use... completing thousands of these internal surfaces with precision accuracy.

For the broaching of both external and internal forms in innumerable parts now used for armament purposes, Detroit Broaches continually meet the most exacting requirements.

**DETROIT BROACH COMPANY**  
20201 SHERWOOD AVENUE • DETROIT, MICHIGAN

**SYMBOL OF DEPENDABLE  
PERFORMANCE IN TOOL STEELS**



Coppco water hardening (gray label) and oil hardening (black label) tool steels have been developed from the long experience of our metallurgical engineers and their familiarity with the users' requirements.

**"COPPCO .75"**

WATER HARDENING **GRAY** LABEL

Hardens to give greater toughness than Coppco Universal or Coppco 1.10. *Used for:* Shock tools · Extra Large Shear Blades · Swages · Button Sets · Drift Pins · Cold Chisels · Large Hammer Dies · Rivet Busters · Sledges.

**"COPPCO UNIVERSAL"**

WATER HARDENING **GRAY** LABEL

Balanced hardness and toughness. Good cold cutting properties. *Used for:* Pneumatic Tools · Large Shear Blades · Punches · Mandrels · Blacksmith Tools · Arbors · Vise Jaws · Dies—*Cold Heading, Trimmer, Heavy Stamping, Drawing, Forming, etc.*

**"COPPCO 1.10"**

WATER HARDENING **GRAY** LABEL

Gives maximum hardness. Holds a keen cutting edge. Resists wear. *Used for:* Milling Cutters · Circular Cutters · Woodworking Tools · Fine Shear Blades · Knives · Drills · Arbors · Reamers · Dies—*Embossing, Jewelers, Cold Heading, Threading, etc.*

**"COPPCO STANDARD"**

OIL HARDENING **BLACK** LABEL

Non-deforming. Deep-hardening. Wear resistant. *Used for:* Broaches · Milling Cutters · Threading and Tapping Tools · Reamers · Precision Tools · Gauges · Dies—*Blanking, Forming, Extrusion, Stamping, Shearing, Trimming, etc.*

"COPPCO" TOOL STEELS ARE ONE OF THE FAMILY

ARISTOLOY  
STEELS

OF ARISTOLOY "SPECIAL QUALITY" STEELS

**COPPERWELD STEEL COMPANY WARREN, OHIO**



**FRONT LINE** Only "seasoned troops" will do in production's front line. At the workheads, where the production rate is determined, rely on tools that have proved their ability to stand up "under fire"!

# MORSE

**THERE IS A  
DIFFERENCE**

**TWIST DRILL AND  
MACHINE COMPANY**

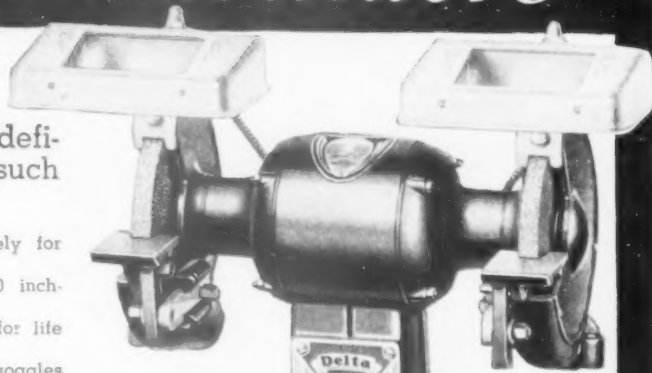
NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. - - - CHICAGO STORE: 570 WEST RANDOLPH ST.

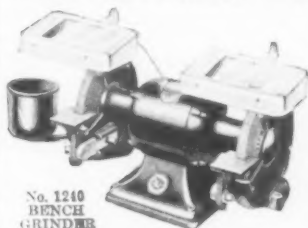
# Here's why shops *busy on the armament program* insist on *Delta Grinders*

SHOPS that need more grinders to speed up war production, know definitely that Delta grinders offer such specific advantages as:

1. Special motors designed and balanced exclusively for Delta grinders.
2. Grinder wheels dynamically balanced to 1/100 inch-ounce.
3. Double sealed-for-life ball bearings—lubricated for life—sealed against grit.
4. Twin-Lite Safety Shield—eliminates need for goggles—provides illumination on both sides and face of wheels.
5. Fully machined, easily adjustable tool rest—rigidly mounted adequate guards.



## Also Bench Models



No. 1240  
BENCH  
GRINDER

Built in both single phase and three phase models, bench and pedestal types, there is a Delta grinder to fit every shop. The motor-driven bench grinder also incorporates all of the

latest Delta design and construction features . . . Twin Lite Safety Shields . . . double seal New Departure ball bearings . . . strong and efficient wheel and spark guards . . . absolute freedom from vibration (due to especially balanced Aluminous Oxide wheels).

## Send for Catalog

Send coupon below for Delta Catalog giving full details and specifications on the complete line of Delta grinders.



No. 1246  
PEDESTAL  
GRINDER

### Other Delta Low - Cost Machines



A complete line of single and multiple spindle 14" and 17" drill presses in slow and high speed models.

#### METAL CUTTING BAND SAW

Cuts almost anything in metals and plastics from jig and fixture bases 1 1/2" by 2" thick to draw die segments 6" thick.



#### CUT-OFF MACHINE

Cuts speedily and to exact lengths a wide variety of materials. Priced at one-half the usual cost of machines of this type.

# DELTA

## MILWAUKEE



The Delta Manufacturing Company

409-C E. Vienna Avenue, Milwaukee, Wis.

Please send me your special Grinder Bulletin giving full details and specifications on the complete line of Delta Grinders. ☐ Also send me your latest Delta catalog of industrial power tools.

Name .....  
Address .....  
City ..... State .....

# GRAPHITIC STEEL MACHINES

## TIGHT BO

### THE FASTER WE RUN THE FARTHER WE GO

Graphitic Steel will help you get more surface foot per minute and make a definite contribution toward speeding up Victory. It will help you compete favorably when Victory brings business back to normal again.

non

wea

you'll understand why it's in such demand.

Ask for your copy of the new Graphitic Steel Defense Handbook.

**THE TIMKEN ROLLER BEARING  
COMPANY, CANTON, OHIO**

# TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

## GRAPHITIC STEELS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

# Engineered Production

For Milling On Small  
Arms, Fuses, Bomb Parts

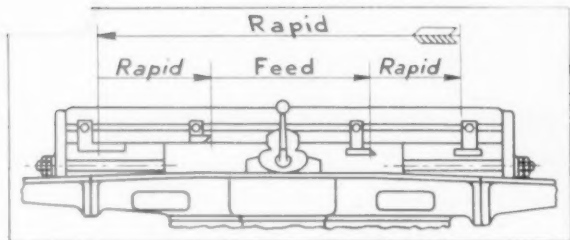


# HTLY OUND

Automatic table-cycles for about everything; with climb cutting and conventional milling in various arrangements for maximum production and operating convenience. Easily adjusted standard dogs control usual table-cycles; special dogs handle unusual conditions.

For Example... Standard No. 00 Hydraulic Rigidmil shown here is climb-milling grooves 0.057" wide by 0.281" deep, in brass pieces 1 1/2" long. Limits,  $\pm 0.002$ " on width, half that on depth. Usual table-cycle, and Sundstrand-designed automatic fixture with loading tray, gives Engineered production of 1800 pieces an hour. With suitable cutters and fixtures, same machine can be applied quickly to high production of other parts: for small arms, fuses, bombs, instruments, machine guns, control apparatus, and a wide variety of other small milling jobs for military matériel or civilian supply.

ous automatic table-cycle; accurately controlled by easily adjusted dogs, three standard and one special; gives average production of...



**1800 pieces an hour on these →**



## ← Read This Book

For complete information about capacity, speeds, feeds, cycles, and exclusive advantages of No. 00 Hydraulic Rigidmil, read book shown at left. A copy will be sent to you promptly on request. Ask for T-00-1.



## SUNDSTRAND MACHINE TOOL CO.

2532 ELEVENTH STREET, ROCKFORD, ILLINOIS, U. S. A.

# GRAPHITIC STEEL MACHINES

# 25%

# FASTER!

**THE FASTER WE RUN  
THE FARTHER WE GO**  
Graphitic Steel will help you get more surface foot per minute and make a definite contribution toward speeding up Victory. It will help you compete favorably when Victory brings business back to normal again.

Add to this its remarkable non-seizing, non-scuffing, long wearing characteristics and you'll understand why it's in such demand.

Ask for your copy of the new Graphitic Steel Defense Handbook.

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**TIMKEN**  
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**GRAPHITIC STEELS**

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

# Engineered Production

## For Milling On Small Arms, Fuses, Bomb Parts **Number 00** **Hydraulic** **Rigidmil** **Has Everything**

**Feeds For Everything...** No. 00 Hydraulic Rigidmil has 128 total spindle speeds, in two ranges: Type A, 57 r.p.m. to 2416 r.p.m.; and Type B, 85 r.p.m. to 3600 r.p.m. Here are speeds for best results on small milling jobs in everything from steel to aluminum or magnesium.

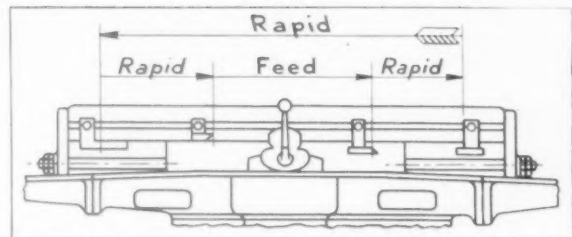
**Feeds For Everything...** Sundstrand Hydraulic equipment gives you any feed rate whatever in standard range of  $\frac{1}{2}$ " a minute to 37" a minute, or optional range of  $1\frac{1}{4}$ " a minute to 65" a minute. Here are feeds for roughing cuts and fine finishes: for every requirement.

**Cycles For Everything...** Rapid traverse of 400" a minute combines with hydraulic feeds in the No. 00 Rigidmil to give continuous or semi-automatic table-cycles for about everything; with climb cutting and conventional milling in various arrangements for maximum production and operating convenience. Easily adjusted standard dogs control usual table-cycles; special dogs handle unusual conditions.

**For Example...** Standard No. 00 Hydraulic Rigidmil shown here is climb-milling grooves 0.057" wide by 0.281" deep, in brass pieces  $1\frac{1}{2}$ " long. Limits,  $\pm 0.002$ " on width, half that on depth. Usual table-cycle, and Sundstrand-designed automatic fixture with loading tray, gives Engineered production of 1800 pieces an hour. With suitable cutters and fixtures, same machine can be applied quickly to high production of other parts: for small arms, fuses, bombs, instruments, machine guns, control apparatus, and a wide variety of other small milling jobs for military matériel or civilian supply.



This unusual continuous automatic table-cycle; accurately controlled by easily adjusted dogs, three standard and one special; gives average production of...

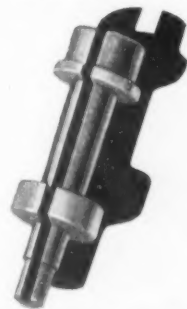


## 1800 pieces an hour on these →



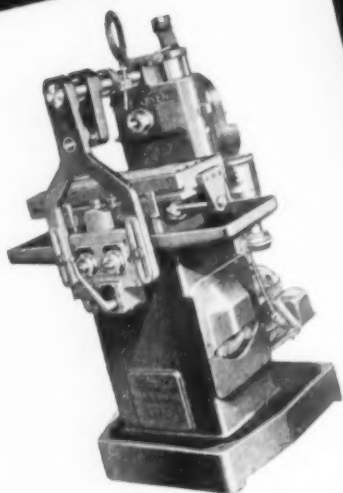
### ◆ Read This Book

For complete information about capacity, speeds, feeds, cycles, and exclusive advantages of No. 00 Hydraulic Rigidmil, read book shown at left. A copy will be sent to you promptly on request. Ask for T-00-1.



## SUNDSTRAND MACHINE TOOL CO.

2532 ELEVENTH STREET, ROCKFORD, ILLINOIS, U. S. A.



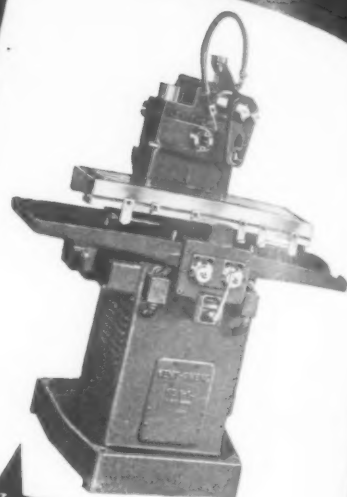
No.  
1-8

8" table travel... 25" by 9" table... hydraulic table feed... simple automatic cycle.



No.  
2-20

20" table travel... 42" by 12" table... full automatic hydraulic table feed.



No.  
1-14

32" by 9" table... 14" table travel... hydraulic table feed... full automatic cycle.

## EVERY ONE A STAR!

Are you looking for Milling Machines that mill accurately, efficiently, day in and day out without trouble... milling machines that take your War jobs out of the tool room and put them on a production basis? *You need Kent-Owens Milling Machines!*

*Rugged... Simple... Efficient...* they provide the advantages and features that practical shop men demand. They've got the guts to do the tough jobs RIGHT! Send for latest bulletins. Contact your nearest representative or write us direct. Kent-Owens Machine Company, Toledo, Ohio.

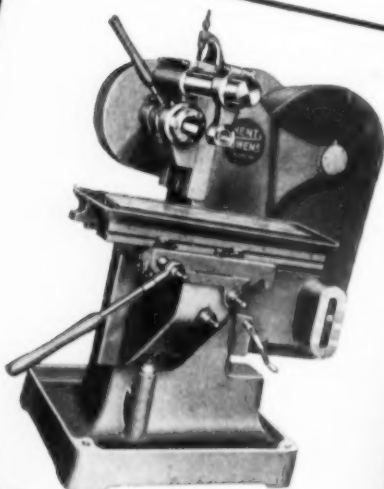
## Call on **KENT-OWENS** for Milling Machines

### THERE'S A KENT-OWENS REPRESENTATIVE NEAR YOU

BOSTON  
General Machinery Corporation  
BUFFALO  
Don W. Patterson  
CHICAGO  
Neff, Kohlbusch & Bissell  
DALLAS  
Hamilton-Huster Machinery Co.  
DAYTON  
Gosiger Machinery Company  
DETROIT  
A. C. Haberkorn Machinery Co.  
GRAND RAPIDS  
Joseph Monahan  
HOUSTON  
Oliver H. Van Horn Co., Inc.

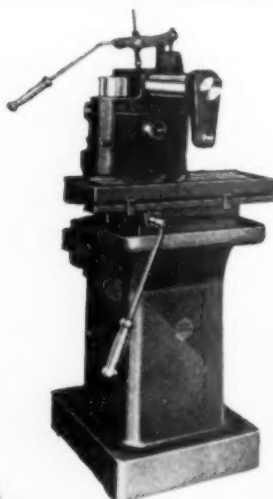
INDIANAPOLIS  
Oatis-Booth Machinery Co.  
LOS ANGELES  
Eccles & Davies Machinery Company  
Harron, Rickard, & McCone  
MILWAUKEE  
Neff, Kohlbusch & Bissell  
MOBILE  
John J. Normoyle Company  
MONTREAL  
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Wilson Brown Company  
PHILADELPHIA  
Calco Machinery Company

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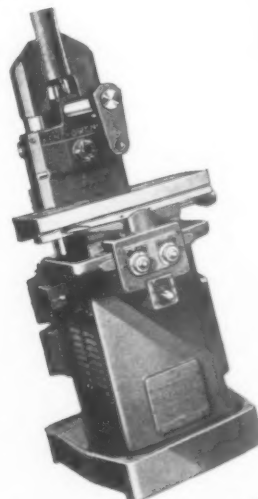
No.  
2-RV

3 H. P... hand feed to table and head... spindle speed range 100 to 1200 R. P. M.



No.  
1-M

Hand feed to table and head... 25" by 9" table... 1 H. P... head counterbalance is adjustable.



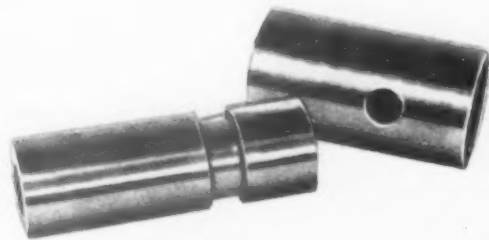
No.  
1-V

Hydraulic vertical head feed... 5 1/2" head travel... 25" by 9" table.

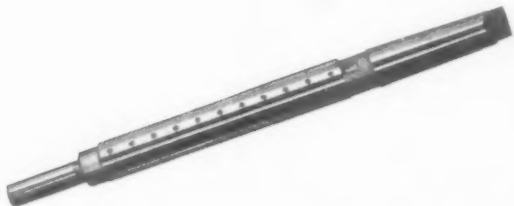
# Forestall Replacement Problems!



These 2 1/4-in. long plunger lever pins for diesel engines are cast of Haynes Stellite alloy and finished by grinding to accurate dimensions.



This 2-in. O. D. piston and cylinder, for use in a die casting machine, are made of Haynes Stellite alloy to withstand abrasion, heat, and corrosion.



Haynes Stellite wear strips on boring, driving, and pilot bars keep them accurately aligned, eliminate galling, and reduce maintenance.



These Haynes Stellite valve stem caps for diesel engines are used to combat severe conditions of abrasion and heat.

## *use Haynes Stellite Alloy Parts to resist*

### *ABRASION... HEAT... CORROSION*

• Machine and automotive parts which are made of Haynes Stellite alloy stand up for long periods of use even when subjected to severe abrasion, erosion, heat, or corrosion. For this reason, parts made of this wear-resistant alloy are being used increasingly at vital points to help avoid shutdowns... to reduce maintenance costs... and to forestall problems of parts replacement.

Haynes Stellite alloy specialties ranging in size and shape from phonograph needles to intricate, cored castings like the lever pins shown above are regularly made to order—cast and ground to customers' specifications. Stampings or forgings of a malleable grade are also supplied. For more information, write or phone the nearest district office—today!

### Take Advantage of This Unique Combination of Properties

- Haynes Stellite alloy is inherently hard and abrasion-resistant, even at red heat.
- Haynes Stellite alloy is resistant not only to atmospheric corrosion, but also resists the action of many corrosive materials.
- Haynes Stellite alloy takes a high polish.
- Haynes Stellite alloy has a low coefficient of friction.

## **HAYNES STELLITE COMPANY**

*Unit of Union Carbide and Carbon Corporation*

New York, N. Y. **UCC** Kokomo, Indiana

Chicago—Cleveland—Detroit—Houston—Los Angeles—San Francisco—Tulsa

"Haynes Stellite" is a registered trade-mark of Haynes Stellite Company

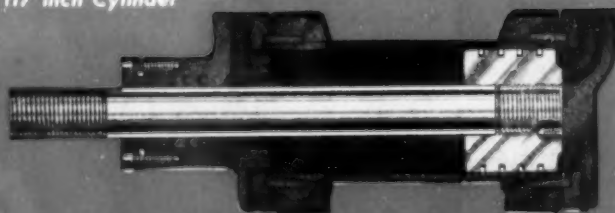
# BIG OR LITTLE



117 inch Cylinder



2 inch Cylinder



Sectional View

## Hannifin Precision Cylinder Construction Means High Efficiency Use of Hydraulic Power

Hannifin hydraulic cylinder construction and finish is uniform for all sizes providing for maximum utilization of the advantages of hydraulic power no matter what the application. Hannifin Cylinders of 11 inch bore, 16 feet long, weighing 3,640 lbs., are but one example of large cylinders regularly produced by Hannifin precision methods.

Mirror finish honing of the cylinder bore, even in sizes as large as 22 feet long, produces a straight, round, perfectly smooth cylinder interior. This means high efficiency piston seal, minimum fluid slip, long life, and maximum useful power. No-tie-rod design allows removal of end caps without collapse of other parts, and also permits independent positioning of end caps for convenient installation.

Hannifin hydraulic cylinders are built in seven standard mounting types, with small diameter piston rod, 2 to 1 differential piston rod, or double end piston rod, with or without adjustable cushion. All sizes, any length of stroke, for working pressures up to 1000 and 1500 lbs. sq. in. Special types built to order, any size, for any pressure.

Write for Bulletin 35 giving complete specifications.

## HANNIFIN MANUFACTURING COMPANY

621-631 South Kolmar Avenue, Chicago, Illinois

Detroit Representative: R. A. BEAN  
Hayward Building, 4829 Woodward Avenue  
Telephone Columbia 4949

# HANNIFIN HYDRAULIC CYLINDERS

# THE TOOL ENGINEER

T.M. Reg. U.S. Pat. Office

Volume XI, Number 3

## ENOUGH QUICK ENOUGH

**P**EARL HARBOR was surprised and our forces paid dearly. But Singapore was smashed, not surprised. It was another battle of France without a Dunkirk. There were not enough airplanes, or guns or men. Production had failed them. They did not have enough quick enough.

Prime Minister, John Curtin, immediately after Singapore's fall, told his people, "This means clearly and specifically that *every human being in the country* is now at the service of the Government, to work for the defense of Australia. *All men and women* of suitable age are expected to do some useful *military work* and *undergo training* in addition to their normal work." In other words, every one must give his all for victory, must subordinate everything to that one supreme objective—to win by providing enough man power and supplies quick enough.

Only production and more production of airplanes, tanks, guns and ammunition can make our sons, our brothers and fathers victorious. Production is our first line of defense. It's something we have to do right here at home. The Tool Engineer's job is one of the first in defense production. In fact, until his job is finished, production can not start. How well he does his job will in a large measure determine if our Army and Navy get enough supplies quick enough.

We are told the military quota for 1943 is 9,000,000 fighting men. Such an Army cannot be recruited without taking most of the able bodied young men out of every shop in this nation. Who are going to take their places? Women, boys and older men, of course. If we are going to win this war we've got to go all out just like the Australians.

The present ratio of 18 civilian workers to each fighting man must be greatly reduced. Such a ratio calls for 162 million workers, more than all the men, women, and children in this whole country. That's why Tool Engineers are so necessary.

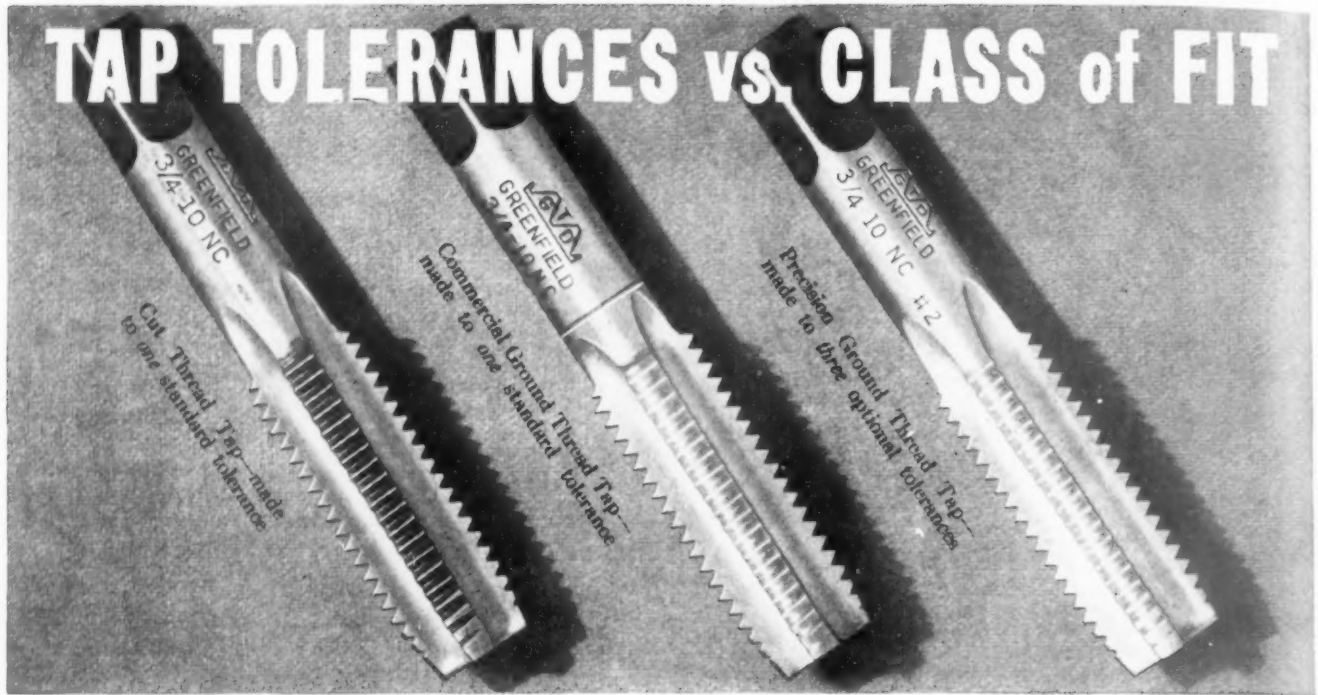
They must provide production equipment to compensate for the lack of workers. Production methods must be improved, machine operation and fixtures made so simple and fool proof that any boy, woman or old man can operate them with the minimum training. They must be able to produce parts accurately and quickly with the least spoilage. Otherwise we still won't have supplies enough quick enough.

Tool Engineers will have two other big jobs: first, they must keep machines and fixtures running 24 hours a day; second, with the millions of inexperienced workers, after hours training is going to be indispensable. Who are more competent to do this training job than our practical Tool Engineers?

Machines now run 24 hours a day in England. War workers eat at their machines. Food is brought to them. They don't quit and shut down their machines when their "trick" is done. They keep their machines running until they are relieved. Until we do that in this country we can't hope to get war materiel quick enough.

American Tool Engineers, in the past, have shown the world how to get *maximum production* at lowest cost. Now, they must show the world how *quickly* they can get maximum production. All the world is waiting to see how quickly America will get into its production stride. Tool Engineers will need broad shoulders if our forces don't get enough supplies quick enough.

# TAP TOLERANCES vs. CLASS of FIT



A common source of confusion in tapping is failure to distinguish between CLASS of FIT as applied to the PRODUCT, and PITCH DIAMETER LIMITS as applied to PRECISION GROUND THREAD TAPS. The cause of this confusion doubtless is the fact that both terms involve the use of a similar, but not identical, series of numbers, and that the corresponding numbers have no direct relationship.

CLASS of Work FITS or "Screw Thread Assemblies" are:

No. 1—"Loose"      No. 2—"Free"  
No. 3—"Medium"    No. 4—"Close"

Optional Pitch Diameter LIMITS or TOLERANCES of Precision Ground Thread Taps are: No. 01, No. 1, No. 2.

The table at the right indicates the taps which normally will produce Class 2 and 3 Fits, the ones most commonly used. Ordinarily, when using Precision Ground Thread Taps it is best to determine what screw assembly fit is required, then the Tap to produce threads for that fit may be selected by trial from the optional tolerances available.

Size	Threads per Inch			Class		Size	Threads per Inch			Class	
	NC	NF	NS	2	3		NC	NF	NS	2	3
1/4	20	..	..	Cut	CG	0	..	80	..	PG 1	PG 1
5/16	18	..	..	Cut	PG 2	1	64	..	..	PG 1	PG 1
3/8	16	..	..	Cut	CG	..	72	..	..	PG 1	PG 1
7/16	14	..	..	Cut	PG 2	2	56	..	56	PG 1	PG 1
1/2	13	..	..	Cut	CG	..	64	..	..	PG 1	PG 1
9/16	12	..	..	Cut	CG	3	48	..	..	CG	PG 1
5/8	11	..	..	Cut	CG	..	56	..	..	CG	PG 1
11/16	10	..	..	Cut	CG	4	40	..	..	CG	PG 1
3/4	9	..	..	Cut	CG	..	48	..	..	CG	PG 1
7/8	8	..	..	Cut	CG	5	40	..	36	CG	PG 1
1	7	..	..	Cut	CG	..	44	..	..	CG	PG 1
1 1/8	6	..	..	Cut	CG	6	32	..	..	CG	PG 1
1 1/4	5	..	..	Cut	CG	..	40	..	..	CG	PG 1
1 3/8	4	..	..	Cut	CG	8	32	..	..	CG	PG 1
1 1/2	3	..	..	Cut	CG	..	36	..	..	..	PG 1
1 3/4	2	..	..	Cut	CG	10	24	..	..	..	PG 1
2	1	..	..	Cut	CG	..	32	..	..	Cut	PG 1
2 1/4	1	..	..	Cut	CG	12	24	..	..	or	PG 1
2 1/2	1	..	..	Cut	CG	..	28	..	..	CG	PG 1
2 3/4	1	..	..	Cut	CG	14	..	20	..	..	PG 1
3	1	..	..	Cut	CG	..	..	24	..	..	PG 1

## SYMBOLS

CUT—Cut thread taps, either in carbon or high speed steel.

CG—Commercial ground thread taps in high speed steel. See Standard Tables.

PG—Precision ground thread taps.

*This is one of a series of advertisements published by Greenfield Tap & Die Corporation to help users get greater production from their small tools in these critical times, through making useful facts more widely known*

More detailed information on this whole subject may be found in "Greenfield's" free book "FACTS ABOUT TAPS AND TAPPING." Send for a copy.

**GREENFIELD TAP AND DIE CORPORATION**

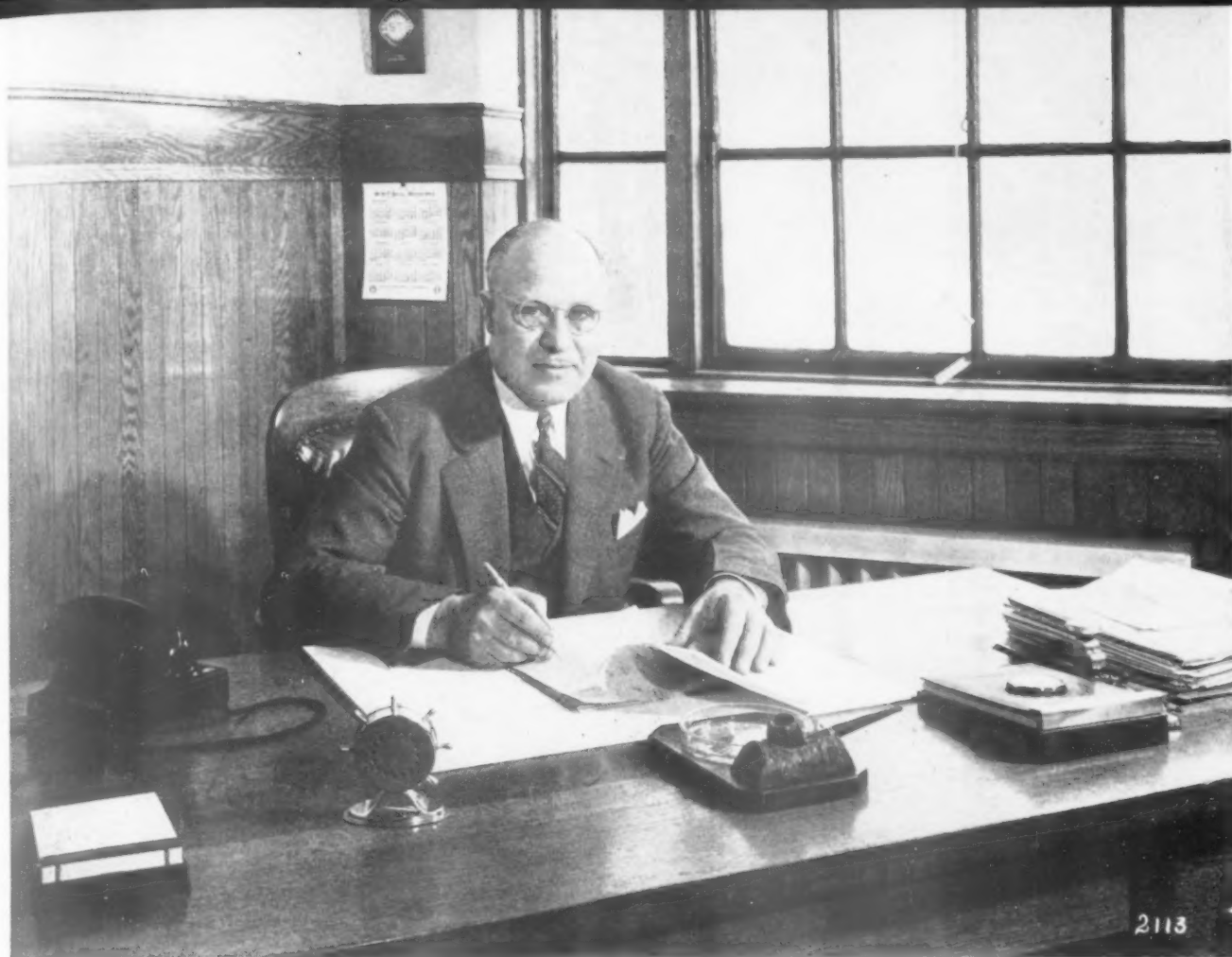
GREENFIELD • MASSACHUSETTS

GREENFIELD TAP AND DIE CORP. OF CANADA, LTD., GALT, ONTARIO

**GT D GREENFIELD**

TAPS • DIES • GAGES • TWIST DRILLS • REAMERS • SCREW PLATES • PIPE TOOLS

THE TOOL ENGINEER



2113

## United for Victory . . . —

*Frank W. Curtis.*

President, American Society of Tool Engineers

IN March 1932, a group of Detroit Tool Engineers, who felt that through contact with each other they could derive many benefits, both technically and socially, organized the American Society of Tool Engineers. They were a mere handful then, just 33 to be exact. The rapid progress of that group, however, soon spread and, today, our Society has about 10,000 members and more than 50 Chapters, located in the largest industrial areas from Coast to Coast and in Canada.

During the past year, more than 3,000 members have joined the A.S.T.E. — New Chapters have been chartered in Nashville, Hamilton, Ontario, San Diego, Fond du Lac, Portland, Maine, Akron, Washington, D. C., Williamsport, Montreal, Dallas and Wichita. Other Chapters have increased their memberships considerably, some more than double. All this expansion has resulted from the de-

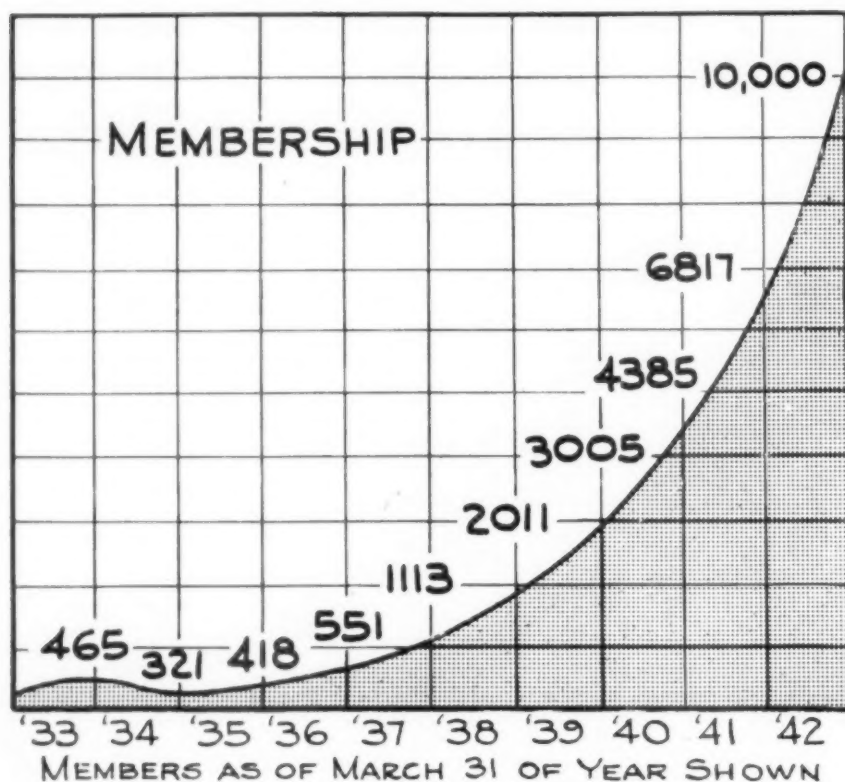
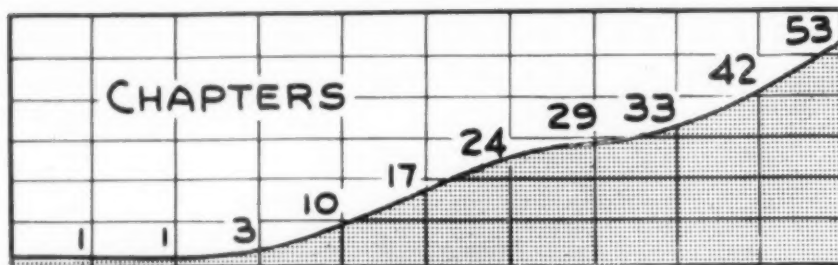
sire of Tool Engineers to interchange technical knowledge and to acquire information dealing with advanced manufacturing practices.

Befittingly enough we shall hold our tenth anniversary annual meeting, in St. Louis, March 26 to 28, to celebrate this growth, unquestionably the most outstanding ever recorded by any technical society, and an achievement that clearly exemplifies the importance of Tool Engineering to industry. More important, however, is the prominent position we hold as Tool Engineers, today, to contribute to our All-Out Victory Program. Nothing must stop us in facing that opportunity with a determination to win as quickly as possible.

America's war production schedule is showing signs of healthy progress. Much of this is due to the rapid advances made in the field of Tool Engineering. As an example,—through

the Tool Engineers vast improvements in tooling methods, machine tools are now capable of turning out up to twice as many parts, per day as was possible a decade ago, and all this without any sacrifice in quality or interchangeability. Other comparable engineering advancements may be noted in various branches of industrial plants.

Our present tooling methods have made it possible for inexperienced workers, or those with very little practice, to produce parts within limits of extreme accuracy, thus releasing the more experienced mechanics for occupations requiring their skill. This has done much to relieve congestion in industry as well as to broaden the fields for our defense products. Modern tooling methods also have made possible the high production of parts to "tenths", rather than "thousandths", a factor that contributes



greatly to the elimination of wear and the assurance of longer life, as well as a more dependable product. In

view of this, the science of Tool Engineering has become the backbone of industry to which we must depend for

successful manufacture.

Through co-ordinated developments in Tool Engineering, extremely rapid change-overs from one kind of product to others of entirely different types have been accomplished in relatively short time. In many cases, complete manufacturing changes have been made in from three to six months, an almost undreamed of task a few years ago, but an achievement that has unquestionably strengthened our defense position.

The noteworthy success of our aircraft industry during the past year, for example, is largely due to the Tool Engineer's ability to apply basic principles of tool and die design for the making of parts of a nature somewhat different than usually encountered, with accuracy and output predominating. In fact, tooling in its broad sense has been the most outstanding contribution in bringing our aircraft production to its present level, estimated to reach 60,000 war planes annually by late Summer. Much has been accomplished in this direction through standardized units of tool design that enable the completion of tooling in relatively short time.

Tool Engineers have contributed largely in devising methods for the high production of other armaments such as tanks, guns, ammunition and ships, as well as the machine tools used to produce them. While we can point with pride to these accomplishments, there still remains much to be done and we must unite our efforts more than ever before so that a quick Victory will be assured.



**J. A. SIEGEL**  
President  
1932-1933



**W. H. SMILA**  
President  
1933-1934



**T. B. CARPENTER**  
President  
1934-1935

# What Are We Going to Do With It?

?



?

By O. B. JONES

FOUNDER

AMERICAN SOCIETY OF TOOL ENGINEERS

**Editor's Note: Mr. Jones, recently in a severe accident, is now well on the road to recovery. His deep interest in A.S.T.E. prompted him to write this challenging article.**

GATHER around ye hearties and let's look at this fifty-cylindrical ten-thousand-detail machine we have built and see if we can increase its productive capacity. Nearly fifteen thousand of us have contributed to its development at some time or other since it was first sketched ten years ago.

Being Tool Engineers, I'm sure we will always see improvements we can make in it. In fact we have already worked a lot of bugs out of it, so I believe you will agree with me that it's time to throw it into high-g geared production.

Ordinarily we have been able to turn our machines over to the production department after a preliminary run and forget them. This time we can't do that. We who designed and built the machine must run it. That should be an interesting and thrilling experience, for this machine we call the American Society of Tool Engineers, is capable of doing lots of tremendously important things.

As we stand here and look back at our past ten years' activity we can see that we have been so busy taking care of details, forced upon us by the

rapid growth of our Society, we haven't had time to think as much as we would have liked to about what a Society like ours can and should do to help to the fullest extent each of its members, other organizations and society in general. We all realize that as our Society has grown but so have our responsibilities.

To exactly indicate what our responsibilities and opportunities are would be too much to expect of any one of us. But goals must usually be dreamed before they can be attained. Perhaps we ought to have a permanent "Goals Committee" to set goals for us. Some of these goals might be attained in a matter of months but some should certainly be set for attainment years in the future. Such things hold organizations together by providing a unity of purpose and action.

The goals committee would need men on it who are imaginative, idealistic and fearless. This would be no place for cowards. Its members should be inherently deeply interested in the welfare of others and consecrated to the belief that the only justification for our existence is service to others. They should set their

goals high so that Tool Engineers, who have been used to doing the seemingly impossible, will accept the challenge. Tasks should be set which will force us to use to the limit our Society's potential strength and enthruse each member and committee to go all out for their achievement. Such tasks are morale builders and make the hair on the chest of the humblest member bristle with pride to be a part of such an organization.

Such a course of planned, or engineered action would inevitably result in that intangible and most valuable asset any organization can possess, — prestige. As we add to our prestige we draw to us successful men of large caliber and high ideals. *Quality* of membership so far transcends *quantity* of membership that it's utterly foolish to attempt to indicate the power, or strength, or usefulness, of a technical society by specifying the number of members within its fold.

After dreams are dreamed they become realities only as a result of following carefully worked out plans. Sometimes dreamers are impractical. Perhaps after the Board of Directors has given its endorsement to goals, ideals and aims submitted to it by the



**R. M. LIPPARD**  
President  
1935-1936



**F. R. LAMB**  
President  
1936-1937



**F. A. SHULER**  
President  
1937-1938

Goals Committee they might be turned over to a "Ways and Means Committee" whose duty it would be to indicate the steps which would have to be taken to insure the attainment of the goals at the time specified.

Incidentally, if these proposed goals, the approved ones and progress reports of their accomplishment, were played up to the limit in *THE TOOL ENGINEER* it would add a luster, a sparkle and a twinkle to its eye that would lead one to suspect it of having a soul. We must be more aggressive and more spirited and all this must shine forth from the pages of our Magazine so it will be an inspiration to each of us and hold the interest of intelligent readers outside our own

Organization. (But perhaps this is something for the Goals Committee to recommend.)

Engineering societies have been loath to besmirch their petticoats in politics but have felt it was their duty to influence legislation directly affecting their profession and its members. Industry can also be stifled by legislation enacted by improperly advised political groups. We owe our existence to industry. But industry is affected by markets, and markets are gained and lost in many devious ways. Maybe moral guidance and justice for all peoples everywhere should be left to the churches and politicians. Maybe engineering societies, for instance, should not be concerned

about the fact that salt, one of the earth's most abundant products, is so taxed that it is a luxury to one half of the world's population. The basic idea of democracy, however, is that each individual and each group is responsible for the acts of all. In any case we will be criticized more for doing too little than for the occasional error we may make in attempting to do much.

When an engineering society becomes one of the largest in America, as ours has, its responsibilities, duties and opportunities are National in scope and manifest themselves in many fields.

To him that much hath been given of him will much be required.



**W. F. WAGNER**  
President  
1938-1939



**J. R. WEAVER**  
President  
1939-1940



**A. H. d'ARCAMBAL**  
President  
1940-1941

# Past, Present and Future

By



Meet old friends and prominent A.S.T.E.'ers in this history of the virile, colorful first ten years of the World's fastest growing technical society.



"HANDY ANDY" RYLANDER

SOME years ago, a President of the United States wrote a history of our country in some five hundred words, an easier assignment, perhaps, than the recording of creation in a short chapter of Genesis. For that matter, the rise and fall of a nation has been epitomized in a single paragraph. But then, the history of nations is largely a matter of the deeds of their leaders; for example, the history of ancient Egypt is a record, not of the common people, or of outstanding engineers and administrators, but of the achievements of the Pharaohs. So with history in general — Cleopatra, Mark Anthony, Julius Caesar, Oliver Cromwell, Gustavus Adolphus, Napoleon — each has been englamoured, the while we are left largely ignorant of the scenes in which they moved. Even as we read of Hammurabi, yet, know but little of the civilizations that flourished along the Euphrates in ancient times.

While the inception and growth of the American Society of Tool Engineers is a tribute to its founders and successive leaders, the first of whom established a forum while the latter directed its business, its actual history is largely a record of membership cooperation and contribution. Leaders have but crystalized the will of the body from which they themselves emerged from year to year. Hence it were hardly fair to the Society as a whole to tersely summarize a collective contribution to an essential branch of applied engineering. For

the design, development and manufacture of precision tools, the processing of metal and plastic products and the intricacies of mass production have latterly attained an exact scientific and engineering status. Who, until the advent of the Tool Engineer, ever thought of interchangeability in terms of close tolerances or expressed manufacturing standards to the fine limitations of micro inches?

However, we'll not be too technical, and it is not in my province to write a history of the A.S.T.E. Rather, I am but pinch hitting for our official historian—O. B. Jones—temporarily *hors de combat* as a result of a tilt with an iron horse and, no doubt, O. B. has forgotten more of the intimate details of the Society than the *most* of us are privileged to know. So, I'll but sketch in the shadows and high lights of events as they are marshalled into review. Many of our members, approaching middle age — although we all have young ideas in this young Society—can look back to the time when the men engaged in mass manufacture were variously known as master mechanics, draftsmen, machine and tool designers, production men and so on. There was no one inclusive term coined to designate the Tool Engineer. That term is modern, ten years old, to be exact, or just as old as the American Society of Tool Engineers, now celebrating its *Tenth Anniversary*.

Up to the inception of the A.S.T.E.,

no school or college had included Tool Engineering in its curriculum, rather, the schools turned out draftsmen of a sort rather than real creative designers; the inventive were often as not in the dog house because they couldn't be held down to the slower pace of the conservatives. As a result, the technical schools graduated mechanical, civil, mining and electrical engineers, the graduates entering industrial life with but the vaguest idea as to how the tools and appliances with which they were to deal were made or processed. They were steeped in science, yet, were turned out into the world with but the thinnest spray coating of practical experience.

The Tool Engineer, on the contrary usually entered into his profession via the practical school of "hard knocks". For him, oftener than not, was the certificate of a completed apprenticeship course rather than the sheepskin of some recognized Alma Mater. Many lacked even a high school diploma, many, no doubt, were graduated from the evening schools, even as many again were inducted into engineering via correspondence schools. What matter? It's the practical application of knowledge that counts, and who shall say that the schools of hard knocks haven't produced their great and near great? The important point is, that the Tool Engineer must have a sound working knowledge of his profession and must apply that knowledge intelligently. If anything, he had everything; intelli-

gence, ambition, application, practical knowledge, a field of operation as broad as illimitable space — everything but recognition. He's getting that now, thanks to the A.S.T.E.

While, in the beginning, the idea of "Tool Engineering" was revolutionary, it created a state of order out of confusion. Previously, the men engaged in the design of tools and the processing of metals had little standing; they were "expense men", considered a necessary evil. The bankers, coldly commercial, weighed the creative genius against the dollar and failed to appreciate his value, while the mossbacks who ran the plants of that day on a build-up of cut-and-try couldn't be sold from a blue print—as scarce in those days as a dimension on a drawing. Yessir, gentlemen, them were the hard days, a natural corollary of the Victorian age of smug conservatism. And I should know, having more than once received my pay slip with the odious term, "expense a/c" noted thereon as a poignant reminder of my employment by grace. Of course, the picture gradually changed, and in time management began to see that Tool Engineers—or whatever they were called—who could design tools and machines to *cut costs* were assets after all. The same held true for the man who could set up a better conveyor line or develop an advanced method for production. The false dawn of a new science, a new kind of engineering was just then becoming visible to the discerning eye.

Then, in '32, the sun of the Tool Engineer definitely rose. In that year, O. B. Jones, then as now President of the Detroit College of Applied Science, Detroit, called together an interested group and, as a result, the American Society of Tool Engineers was formed with a charter membership of some thirty-three members. Joe Siegel headed the embryo Society as President. Personally, I don't know who comprised the charter group, and I suppose that in time it will be a mooted point, like whose ancestors came over in the Mayflower. (By now, that little craft has assumed the proportions of The Great Western.) But O. B. and Joe were there, and Bill Smila and Al Sargent, the latter for several years Secretary and prime mover in the Society. E. J. Ruggles, I understand, was the first Treasurer

—but as previously implied, let's not be too technical. I know that I wasn't there, Al Sargent having sponsored me in, sometime during the early part of '34. In August, of that year, I made my first contribution to the *A.S.T.E. Journal*, (hot stuff, by the way, that was accepted gingerly and with bated breath) and, to check up, I just pulled the copy out of my files and gave it the O.O.

Let's see, now . . . . T. B. Carpenter, Pres.; R. M. Lippard, 1st Vice Pres.; Ford R. Lamb, Second ditto; A. M. Sargent, Secy. and Joe Slavik, Treas. O. B. Jones was editor of the *Journal* and Roy T. Bramson business manager, and besides my first splurge, there were articles by Charles Staples, Prof. John Younger, William J. Boyd and A. H. Johnson, along with an article on Micro-Honing. There was also a pic of Lee Diamond (handsome devil, then) with a li'l write-up listing him a charter member and one of the best designers in the country. Of particular interest is the notation that the *A.S.T.E. Journal* enjoyed the largest circulation of any issue since first published—1600 copies! (Grown some since then, eh, Roy?)

After that, things began to hum. A Standards Committee had been formed, but the sledding was tough at first with the manufacturers mainly reluctant to cooperate. A lot of them thought we were a union. But, the track once iced, the pace quickened and before long a set of *A.S.T.E. Standards* had been determined and a preamble written; today, the *A.S.T.E. Standards* are becoming dog eared from constant reference. I sat in at a few of the early Standards Committee meetings myself, and must say that no group ever worked harder to achieve its ends. But, work or play, there was evidence of that good fellowship for which the Society has become noted, and gradually, I became acquainted with the boys, with many of whom I now share fine friendships. While I didn't see Joe Siegel in action as Pres., I've seen the rest of them come and go—Bert Carpenter, Bob Lippard, Bill Smila, Ford Lamb, Frank Shuler, Walter Wagner, Jim Weaver, A. H. d'Arcambal and Frank Curtis—each with a different personality but each making a definite contribution to the Society. Swell fellows, all of 'em.

In 1935, the *A.S.T.E. Journal* became *THE TOOL ENGINEER*, the *Journal* coming into long pants with the February 1935 issue. Keno! — the name clicked! But even by then, the Society was still a "local", but growing fast. By '36, Racine was in, with H. D. Hiatt as Ch'man, when Detroit reverted to the status of a local, with former *Prex.* Carpenter, as popular as ever, elected President. Then, by the end of '36, thanks to Roy Bramson's untiring efforts as New Chapters Chairman, we had Cleveland, Bridgeport and Chicago; since then they've been coming in so fast I can't keep track. Anyway, that's not my job. But, we began to spread around, took a flyer down to Cincinnati, where we were entertained by Cincinnati Milling, and a boat ride over to Cleveland, which was the time Dan Karpinski had to run for the railing just as he had filled a straight flush. Things like that I can remember, but their chronological order, no.

It seems hardly fair to mention names at all. Faces whiz thru ones memory like a movie film, and one just can't mention them all, besides which, paraphrasing, ten stout hearted men brought in their ten thousand more. But naturally, certain personalities are impressed on ones consciousness—and by now, the *A.S.T.E.* possesses many outstanding personalities. Among these, Ford Lamb stands out prominently, and it is a moot question if the Society would have attained its present stature had it not been for his guiding genius. He had vision, and lived to see his prophecy fulfilled, and he had daring, as shown when he practically mortgaged the Society to put over the first Machine and Tool Progress Exhibition. Oh well, the king is dead, long live the king—whoever he may be. But actually, it's the spirit of the *A.S.T.E.* which lives on.

Well, we have spoken of genesis and growth, little of actual accomplishment. What have we really achieved? What have we, as a Society, actually contributed to world progress? Well, we have made the world *Tool Engineer* conscious, have become a power in the land. We have impressed educational leaders with the need of courses in Tool Engineering, so that now two leading universities—Ohio State and University of Michigan—have established separate

engineering courses devoted to this science. In these, John Younger and O. W. Boston, of Ohio and of U of M, respectively, have made outstanding contributions to the art of metal processing. And, for the first time, as far as this writer knows, theory has been supplemented with training and intensive research.

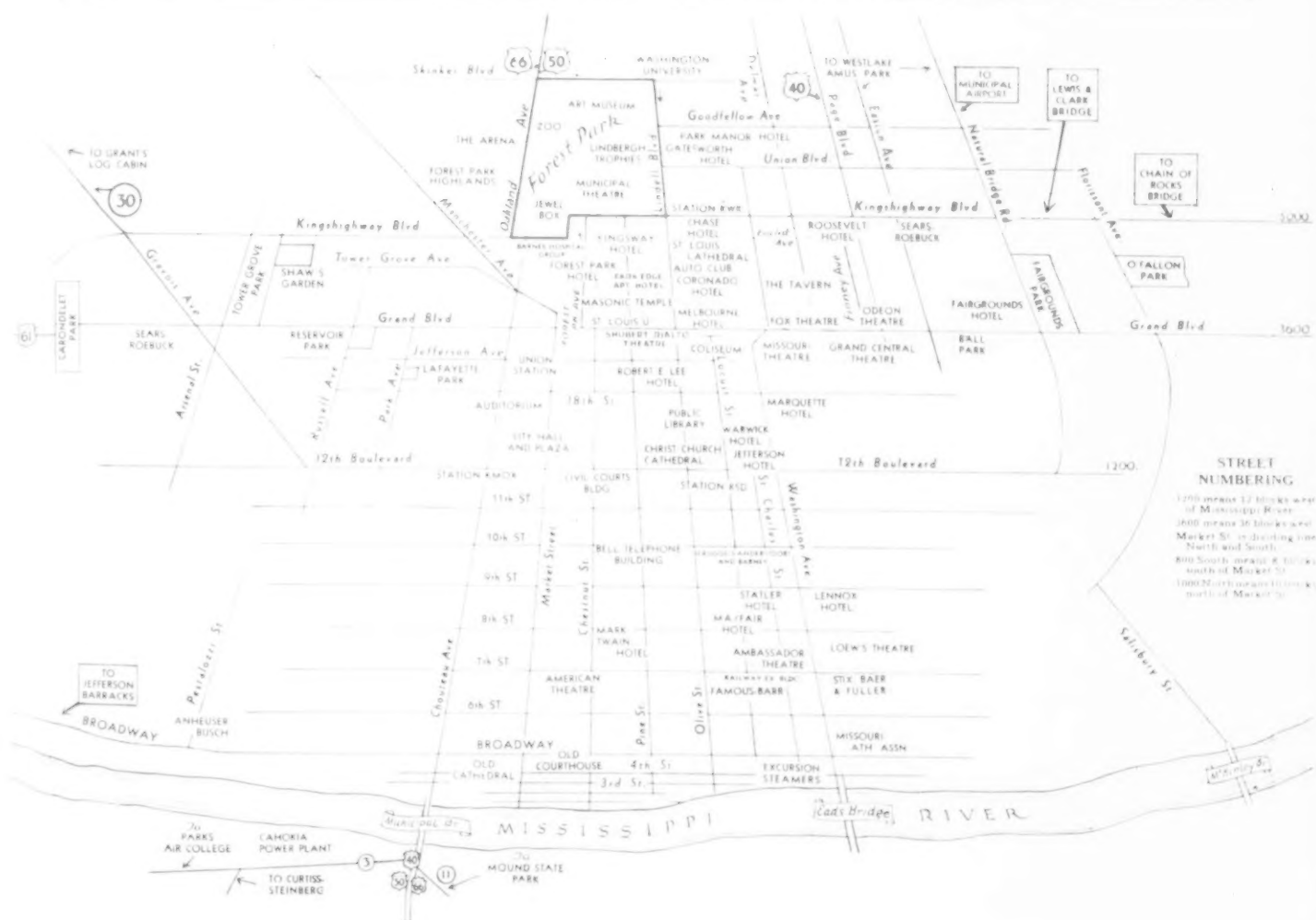
Now, with our country at war, every city in this land, and in our neighboring country of Canada, wherever there is a center of war production, there are classes, directed by trained men, devoted to the study of advanced tooling and manufacturing processes. A term coined in this journal: "The Tool Engineer is the key man of industry", holds good in war as in peace. For even as victory is to be achieved by our soldiers, sailors, marines and flyers, the tools used in the production of their sanguinary equipment must be evolved by a comparatively small corps of Tool Engineers. In a time of national

crisis, ours is truly a grave responsibility, yet, it is a foregone conclusion that we will do our part with the same verve and flair for getting things done that has marked our work in private industry. This, too, will be another achievement to be credited to Tool Engineers.

Personally, however, I would say that the real achievement has been in cohering the men engaged in "tooling the nation"—as Joe Siegel put in the A.S.T.E. song—into a single, unified group. As a result, practical but highly trained men have earned deserved recognition. What is more important, management has learned to recognize engineering genius, not by coercion, not by collective bargaining, but through contact as man to man at our monthly and annual meetings. We have big men in this outfit, but no "brass hats" that can't be spoken of by their first names once you've broken the ice. We are building men, even as we build the tools they use.

Yet, speaking for myself, and expressing a wish long dormant, I would see one great objective, greater in scope than any so far aspired to. I would see unity in the engineering world, with the A.S.T.E. taking the initiative in forming a federation of Engineering Societies. Such a coalition of all engineering societies must inevitably come about, for, the engineers stand for spiritual as well as material progress. Combined, they can be the greatest moral force that the world has ever known, because, most engineers work without prejudice, even as scientists contribute to world progress even when nations clash in war. Wars are transitory accidents, but engineering is progress on an ascending scale. The A.S.T.E. has excelled in emulation, has shown the world what enthusiasm and determination can accomplish in a Society. Let us now look forward to a definite leadership that will shape the world of tomorrow.

## ST. LOUIS CONVENTION GUIDE



# Hospitable St. Louis—

## Scene of March A.S.T.E. Meeting

**Y**OU who have been to St. Louis for conventions before, won't recognize her face and figure when you rail, bus or plane into town March 25th or 26th for the annual convention of the American Society of Tool Engineers.

For one thing, that old dirty face is gone. The city's smoke elimination program—which has been given nation-wide publicity — has really worked.

St. Louis' old figure has become much more streamlined since you saw it last. Do you remember the sprawling riverfront? The old buildings have been torn down and a beautiful park—the Jefferson National Expansion Memorial—has been planned. Government model housing projects are also getting underway and some forecast St. Louis, long known as a city of beautiful homes, will soon be known as a "model city."

As engineers, you also will be interested in the defense plants in the St. Louis area, one of the most vital war production areas in the nation. Located there are a number of aircraft factories, a small arms ammunition plant, and more than 100 companies of all sorts holding defense contracts. Near St. Louis is the huge Weldon Spring Ordnance Plant for the manufacture of T.N.T. and the Western Cartridge Co. plant at Alton, Ill.

While St. Louis today is one of the most important commercial cities in the country and an important city in war production, it still has its background of more than a century of historic events. No visitor is ever at a loss as to what to do or what to see.

Still standing is the Old Courthouse, the scene of the famed Dred Scott case. Near it is the Old Cathedral, one of the oldest churches west of the



Old Court House in St. Louis, the scene of the famous Dred Scott case, only one of many points of interest to be seen while attending A.S.T.E. Meeting.



Mississippi, built on the site of the first Mass in 1764. Also located there is the Old Rock House, one of the oldest buildings in the West, the Eugene Field home and many other interesting historic places. Engineers will be interested in Eads Bridge, the world's first steel-truss bridge,

still in heavy use for rail and highway travel.

As for the modern, there's the St. Louis Zoo. One of the world's most famous, it is known as a model for the care of wild animals. Then, there is Jefferson Memorial in Forest Park in which you can see relics of the Mound Builders, curios of the Indian tribes who traded with the founders of St. Louis, original manuscripts of the French and Spanish days in Missouri and war relics.

If you're interested in art, there's the famous Art Museum with a collection surpassed by few in the country.

In these war times when Tool Engineering is so important to victory every Tool Engineer owes it to himself, his employer and his country to attend the A.S.T.E. Annual Meeting. All five of the excellent technical sessions have been planned around the theme "Conversion to Defense". A glance at the program on the opposite page will convince you of the importance of the type of discussions and the great value of the topics to be presented.

The Jefferson Hotel will be headquarters for all of the A.S.T.E. activities during the Annual Meeting. In addition to the many attractions listed above, St. Louis has many mass manufacturing plants—many of which can be visited. At the time of this writing, definite plans have not yet been completed, but it is contemplated that a number of plant tours will be arranged.

Now, no matter what your interests—our convention in St. Louis is a "must." Clear your calendar and desk and jot the date down on your pad. See you in St. Louis, March 26, 27 and 28 at the American Society of Tool Engineers' Annual Meeting.

# 10th A. S. T. E. ANNIVERSARY MEETING ---- HOTEL JEFFERSON

St. Louis, Missouri

March 26th, 27th and 28th, 1942



**Thursday, March 26th, 2:30 P.M.**

**SUBJECT:**

Conversion from peace time to war time production.

**SPEAKERS:**

Clifford Ives, State Director, Contract Distribution Branch, War Production Board, Milwaukee. Ives will speak on defense contract distribution, finding facilities for contract placements and problems of small shops.

Hugh H. C. Weed, Vice-President, Carter Carburetor Corporation, St. Louis. Mr. Weed will deal primarily with the management problems involved in converting a plant from peace time to war time production, including problems of engineering, manufacturing, personnel, etc.

**CHAIRMAN:**

D. D. Burnside, Superintendent, American Stove Co., and Chairman St. Louis Chapter.

**Thursday, March 26th, 8:00 P.M.**

**SUBJECT:**

Substitutions and shortages of materials.

**SPEAKERS:**

Arthur Stockstrom, President, American Stove Co. Mr. Stockstrom will speak on the general problems of non-defense industries and how they have been handled.

Dr. D. R. Kellog, Westinghouse Electric & Manufacturing Co. Dr. Kellog will speak on general engineering, manufacturing and metallurgical problems involved in materials substitution.

**CHAIRMAN:**

Clarence Miller, Sales Engineer, The Measuregraph Company, Chairman Elect, St. Louis Chapter.

**Friday, March 27th, 9:30 A.M.**

**SUBJECT:**

Cutting Tool Conservation.

**SPEAKERS:**

A. H. d'Arcambal, Vice President, Pratt & Whitney Div. Niles-Bement-Pond Co., will speak on cutting tool design and getting the greatest service out of cutting tools.

L. W. Lang, Sales Manager, National Tool Salvage Co., will talk on salvaging worn-out cutting tools, usually thrown in the scrap bin.

Prof. O. W. Boston, University of Michigan, will talk on how to increase tool life and production with proper cutting fluids.

**CHAIRMAN:**

Ernest Clark, President, Clark Equipment Co.

**Friday, March 27th, 2:30 P.M.**

**SUBJECT:**

Problems Relating to Defense Inspection.

**SPEAKERS:**

Col. Roswell E. Hardy, Deputy Chief, St. Louis Ordnance District. Col. Hardy will speak on the problems of government in defense inspection.

F. E. Allison, Chief Inspector, Wagner Electric Corporation, will speak on industries' problems with particular emphasis on government specifications and inspectors.

**CHAIRMAN:**

William H. Scheer, President, Wm. H. Scheer Co.

**Friday, March 27th, 6:30 P.M.**

**ANNUAL BANQUET:**

Gold Room—Jefferson Hotel.

**SPEAKERS:**

Installation National Officers—Entertainment.

**Saturday, March 28th, 9:30 A.M.**

**SUBJECT:**

Aircraft Mass Production.

**SPEAKERS:**

Col. Kenneth B. Wolfe, Materiel Division, Army Air Corps, Wright Field, Dayton, Ohio, will talk on problems of the service influencing design, procurement and production.

H. E. Linsley, Wright Aeronautical Corporation, Paterson, New Jersey. Subject: Manufacture of Aircraft Engines.

**CHAIRMAN:**

E. A. Doogan, Chief Tool Designer, Curtiss-Wright, St. Louis Plant.

**Plant tours—trips through industrial plants of the St. Louis industrial area—will leave Jefferson Hotel at 9 a.m. March 26th, March 27th.**

## TOOL ENGINEERING --- KEY TO VICTORY



MR. BERNA

A DECADE ago, machine tool production was at its lowest point in modern history. Today, it is at its all-time peak. That, in brief, is the story of the machine tool industry in the last ten years.

In the year of 1932, total business of the entire industry amounted to only \$22,000,000. Today, the industry is shipping that volume of equipment in a week.

No intelligent estimate can be made at this writing of 1942 production, because many plans for further expansion are still in the formative stage, but it is hoped that the industry this year will be able to turn out \$1,500,000,000 worth of machine tools—no less than ten times normal production.

This expansion is even more remarkable when it is realized that the war program calls for a larger proportion of big machine tools, planers, planer type milling machines, vertical boring mills, etc., than are used in time of peace.

The machine tool industry is small by comparison to other industries. Total employment is normally less than that of a single leading automobile or steel company. Only some 300-odd companies build machine tools, and many of them normally employ less than 50 men. Only a few employ as many as 3000. But today, well over 100,000 men are building machine tools.

The tremendous increase in machine tool production was not accomplished overnight. The industry began to fight the battles of the Atlantic and the Pacific even before the defense program in this country was first launched. Machine tool production was increased to the first of its

# Progress in Machine Tools 1932 --- 1942

By

*Tele Berna*

General Manager, National Machine Tool Builders' Assn.

all-time record-breaking years in 1939. Due largely to the defense needs of England and France, machine tool production in that year was expanded to \$200,000,000, substantially over the \$185,000,000 peak of 1929. In 1940, this was more than doubled, to \$450,000,000. And last year's volume was pushed up to \$775,000,000.

Ten years ago, machine tools were almost unknown outside the ranks of those who built or used them. But today, thousands of people who have never seen machine tools have discovered how vitally important they are.

They have learned that to win a war, battles have to be won in industrial plants years before they actually take place on combat zones, years before a gun is actually fired. And the side that has the greatest quantity and best-designed production equipment is the one that ultimately wins.

The United States has a tremendous capacity to produce mechanical equipment. But we are beginning to learn that adapting that capacity to the production of war equipment, the tooling-up of America's gigantic industrial plant for products never required in time of peace, is a colossal undertaking.

Two things are required—more machine tools, of designs particularly needed for war production and in far greater quantities than ever required before, and men with the ability to make those machines produce.

In the design of machine tools we are second to none.

More than in any other decade, sweeping improvements have been made in machine tools in the last ten years. It is estimated that average productivity of machine tools built today is several times that of machines built ten years ago—this, despite the fact that today we must

work to much closer limits.

Outstanding development of the last decade has of course been the widespread adoption of tipped tools. Making possible cutting speeds undreamed-of during the last war, carbide tools have necessitated the complete redesign of some machines in order to back them up with increased power, afford higher speeds, and greater rigidity. This has resulted in tremendously improved units.

It is difficult to single out individual types of machine tools that have gained more prominence than others in the last decade. But one might mention as examples: thread grinders, which now make it practical to grind on a production basis heat-treated threads and metals too hard and too tough to be machined by any other method; broaching machines, which are now used for the machining of all sorts of complicated surfaces, internal and external, on a mass-production basis; and honing and super-finishing machines which now make it possible to finish ultra-precision parts at the rate of several hundred per hour to surface finishes measured in millionths parts of an inch.

Increased production and greater accuracy of all types of machine tools have been supplemented by greater convenience. Built-in gaging apparatus, which reduces the time required by the trial-and-error method and the testing of each piece with hand gages, is a good example of these advances.

American automobiles were copied all over the world. But none could duplicate them, let alone beat them. The combination that produced them—American machine tools and the Tool Engineers and other technicians who put the equipment to work—has proven an unexcelled team.

Our enemies will find that this team is good enough to win this war.

# Uniform Machine Tool Classification

Being used to expedite location of various types of machine tools available in automotive and allied industries.

By **CHESTER S. RICKER**  
Managing Editor, *THE TOOL ENGINEER*

**L**ISTING upwards of 350,000 machine tools in General Motors, Chrysler and Ford plants as well as some 1500 allied plants in the automotive industry is a prodigious task at any time. To do this almost overnight was the task undertaken a month ago by the Automotive Council for War Production. Mr. William J. Cronin, Head of the Machine Tool and Equipment Section, was fortunate that the job did not have to be started from scratch.

It was already underway. General Motors began to do something about it early last year and by September had worked out a machine tool classification that has already proved very helpful. Mr. H. T. Johnson, formerly Master Mechanic at Cadillac, was made Director of Standards and took over the classification of all machine tools for General Motors. In January of this year, the classification scope was broadened and now covers foundry, forging, moulding and rubber-

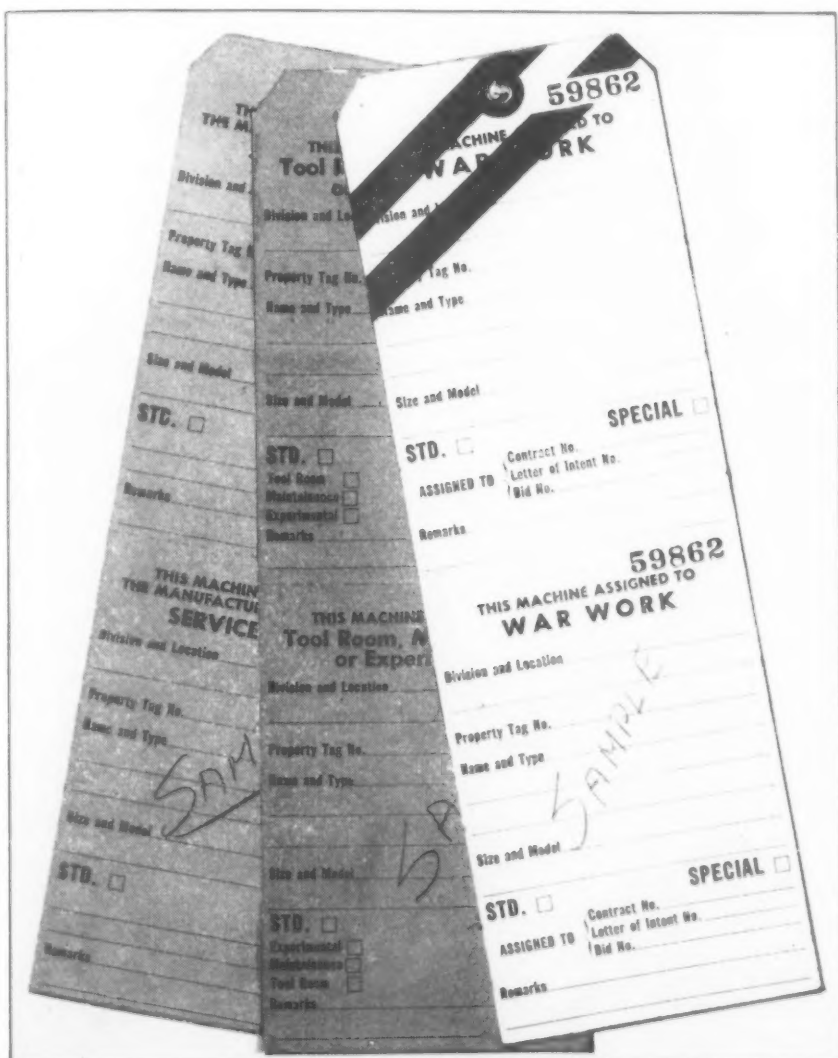
making machinery. For simplicity, the portion of the alphabetical index of the classification reproduced in this month's *TOOL ENGINEER DATA SHEET*, only includes machine tools. The complete uniform machine tool classification book provided by General Motors seemed to be the most logical basis for quick analysis of the available machine tools. It consists of two sections: A, Index, and B, Complete Description with typical makes of each tool listed under each class. By assigning separate symbols to the different machines classified it was easy to tabulate them for quick analysis. Punched tabulating cards can be quickly sorted to show how many machines of a classification are available, where they are located and their condition.

Other large motor companies have found it convenient to use the same symbols when they are making reports of available machines to the Automotive Council or WPB. In this way there is no duplication of effort in cross-checking.

## "SHOP NAMES" DON'T DESCRIBE

Every shop seems to have its own names for certain machines. If a machine was reported with one of the following names, i.e., "Big Bertha", "Queen Mary", or "Submarine" (for a special bearing reamer), how would you classify it? Don Flater, in discussing this uniform machine tool classification with me, said they had a lot of "Wood-peckers" at Chrysler. Can you imagine what they are?

In addition to its immediate use in locating available machines for war production, there is another practical use for a uniform machine tool classification like this. It makes for clearer understanding between Tool Engineers in widely separated shops or industries. Thus, it may prove invaluable to the machine tool industry. It is possible that this machine tool classification may become as helpful to Tool Engineers in writing specifica-



Serially numbered tags attached to machines in use. White tags for war work, green for Tool and Maintenance, yellow for Service.

tions as the S.A.E. Steel & Oil specifications numbers are to Product Engineers and Auto Users.

In the following paragraphs the notations which are used by General Motors in classifying their own machines are given. The following paragraphs also explain how the notations are obtained, their meaning and how they are used. Although all machines may not be coded, there are enough classifications to assure a clear definition of the machines described.

**CLASSIFICATION NUMBER:** In developing this classification, machine tools have been segregated as to type and kind of machine and are identified by a combination of letters and numbers. To insure flexibility an alphabetical prefix has been used to identify the class of machine and a numerical suffix to identify the type of machine in that particular class. For example — the letter "J" designates a "Gear Machine-Cutting", the number "1" indicates that the work revolves on a "Horizontal" axis. Therefore, "J-1" is a "Gear Machine-

effort should be made to place the machine under one of the regular classifications already given. In all cases where machines are listed as special (No. 4), a full description of the machine should be given.

**CLASSIFICATION NAME:** In the preparation of this system of classification every effort was made to make it technically correct. Shop practice and habits have frequently been given precedence over technical perfection. Uniformity has been the prime objective in its development. For example, a "Keller Machine" is listed as a "Milling Machine—Profiling" 0-13, and it is requested that this classification be adhered to as shown in the manual.

**ADDITIONAL MACHINE DETAIL:** The reporting of certain kinds of machine tools requires, in a number of instances, additional information to further identify the machine and the nature of the work to which it could be assigned. For this reason such additional information as size-number, attachments, number of spin-

eral form. Each tag is made up in two parts, each part being alike, the upper half being wired to the machine and the lower half or stub being sent to the Standards Section for a permanent record. Tags used for WAR WORK are printed on white stock with red and blue stripes, giving them a patriotic appearance. Incidentally, this makes a quick visual inventory that should be invaluable when a shop is being inspected by either military, government or organization "brass hats". The other two tags printed on yellow and green stock are for machines which are assigned (a) a yellow tag, to the manufacturer of authorized SERVICE PARTS, and (b) a green tag, to TOOL ROOM, MAINTENANCE or EXPERIMENTAL WORK. If the status of the machine is not indicated on the bottom line, then this machine is listed separately as SURPLUS or AVAILABLE. In the last group additional information is required; the condition of the machine and its book value must be reported. When the machine status is changed, the tag on it is removed and a new one applied. The old tag and the duplicate stub from the new tag come into the Standards Section together for entry on the machine Record Card illustrated.

#### INFORMATION ON CARDS:

The WAR WORK tags also carry the following special notations to indicate to what job it is assigned; Contract No.; Letter of Intent No.; or Bid No. The classification cards must show whether the machine is assigned to TOOL ROOM, MAINTENANCE, or EXPERIMENTAL departments. The tags on machines used to make SERVICE PARTS are self-explanatory but carry space for remarks. All tags carry the information STANDARD or SPECIAL so at a glance the recorder knows how to classify the machine.

**HOW THEY ARE USED:** The classification cards must be made out covering all machines, including those used for Defense and Non-Defense production, regardless of whether they are owned by the General Motors Corporation, the United States Government, or others. The cards must be kept up-to-date at all times and, as previously explained, any change in the status of a machine classification must be immediately reported to the Standards Section.

UNIFORM MACHINE TOOL CLASSIFICATION RECORD	CLASSIFICATION NAME		CLASSIFICATION NUMBER	
	MAKER'S NAME AND MODEL NO.			
	TRADE NAME		SERIAL NO.	
	DIVISION		PLANT	
	PROPERTY TAG NO.			
	IF ACTIVE, USED FOR: PRODUCTION		TOOL ROOM	
	IF SURPLUS AND IDLE CONDITION IS: GOOD <input type="checkbox"/> FAIR <input type="checkbox"/> POOR <input type="checkbox"/>		GROSS BOOK VALUE \$	
	IF DEFENSE, OWNED BY: G.M. <input type="checkbox"/> U.S. <input type="checkbox"/> S.P.C. <input type="checkbox"/> OTHER <input type="checkbox"/>		DEPRECIATION ACCRUED \$	
	MOTOR INFORMATION: VOLTS _____ PHASE _____ CYCLE _____			
	ADDITIONAL MACHINE DETAIL, I.E. SIZE, ATTACHMENTS, ETC.			
YEAR MANUFACTURED		DATE ACQUIRED		
DATE DISPOSED OF		DISPOSITION		
COMMENTS		DATE PREPARED		

Cutting — Horizontal"; J-2 "Gear Machine-Cutting — Vertical"; J-3 "Gear Machine-Cutting — Automatic" and J-4 "Gear Machine-Cutting — Special". Among machines falling under the above classifications are J-1, Hobbing Machine, i.e., Barber-Colman No. 3; J-2, Hobbing Machine, i.e., Lees-Bradner; and J-3, an automatic gear cutting machine, i.e., a Brown & Sharpe No. 3.

**SPECIAL PURPOSE MACHINES:** In cases where a machine is built for a special purpose and cannot be readily converted to a standard type machine, it will be permissible to classify that machine as a Number 4. However, before this is done, every

dles, dimensions in inches, etc., should be shown when listing or reporting a particular special machine. To aid in the reporting of such machines, specific dimensions and other pertinent facts are requested in a number of instances.

**HOW GENERAL MOTORS USES THIS CLASSIFICATION:** General Motors Corporation procedure is very simple. First the Uniform Machine Tool Classification Record Card is made out for every machine and the status of the machine indicated on the bottom line. One of three types of serially-numbered tags are provided by the Divisions; these are illustrated, page 79, to show the gen-

# Tool Engineering DATA SHEET

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*As Applied to Machine Tools by General Motors*

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NOTE: This is the fifth of a series of Data Sheets which will be published in THE TOOL ENGINEER hereafter. A handy three ring binder can be secured at any book, stationery, or dime store and will hold the sheets for convenient and frequent reference.

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# MACHINES *for* VICTORY

**Tool making, munition, tank and aircraft manufacturing machinery is most in demand. New tool developments, increase production and simplify operation. Definitions of machines given for each classification.**

**C**REATION OF A WAR INDUSTRY almost overnight has thrown a tremendous load on the machine tool industry and Tool Engineers. Last month, orders were placed for 100 times as many units of one kind of machine as have been in existence up to now. The WPB is demanding 24 hour usage of machines. Few of the big mass production industries have large machines such as are necessary to build tanks, so there is a great demand for heavy type equipment.

In anticipation of more and more semi-skilled labor, the newest machines frequently have push button control and automatic cycles. Vertical machines are also being used to conserve floor space and in some cases to provide better chip clearance. Vertical gun drilling machines, sometimes with more than one station, have the drills driven from the bottom. With hollow oil drills the chips are flushed out and gravity does the rest. Other drilling machines for rifles have the work rotating and the drills stationary. This eliminates centrifugal effect, which might cause a rapidly revolving small diameter drill of great length to run out. In the munitions field chambering machines are new to most Tool Engineers. They provide the seat for the shell. Finishing gun barrels by broaching is gaining ground. Broaches not only rifle the barrel but also take a shave cut off the bore to give it a final finish.

Automatic cycle multiple tool lathes are finding wide application in shell making. Gear making tools are also much in demand for all branches of the service.

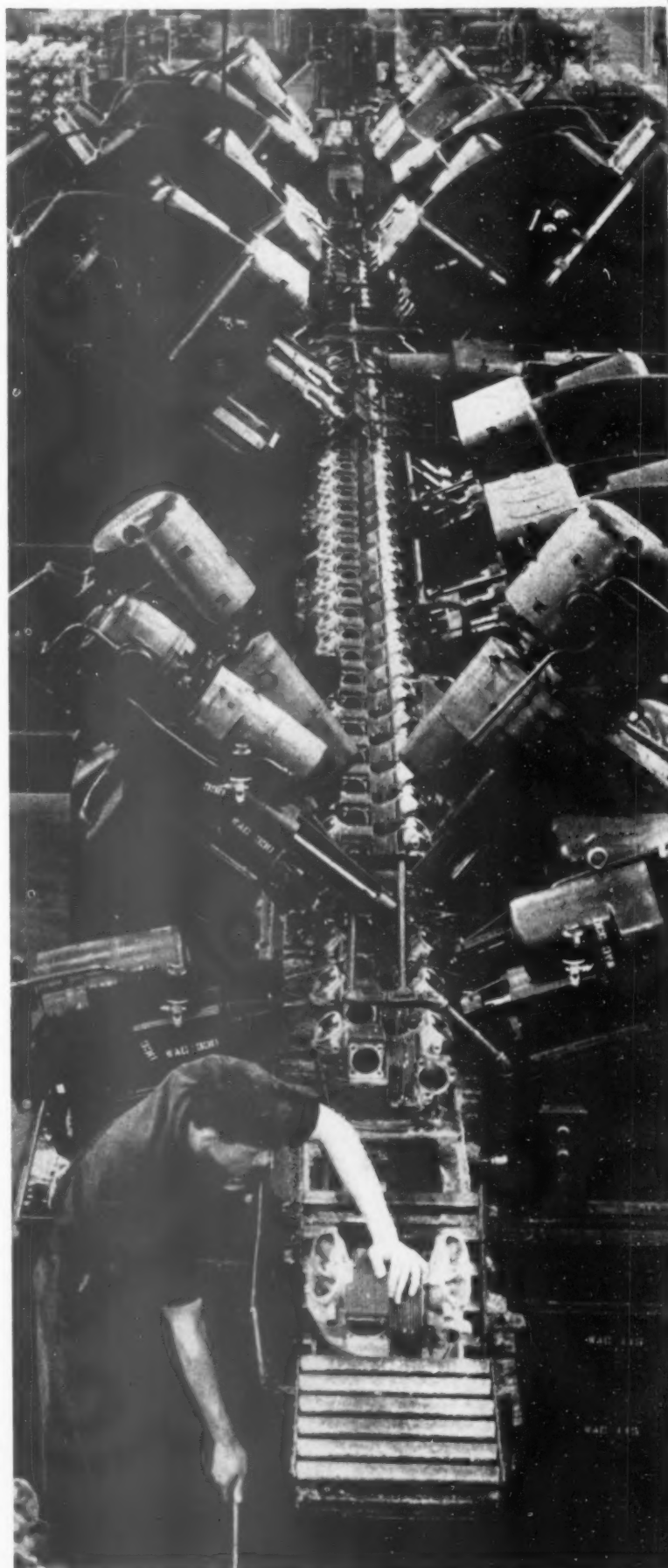
Small vertical chucking lathes are an interesting development. The work is rotated on a vertical axis and turned with one or more tools at a time.

Cemented carbide tools have so speeded up the rate of production that many machines had neither the rigidity or the power necessary to maintain accuracy or top output. Now there are evidences that with newly designed machines, tools not the machine will limit the output.

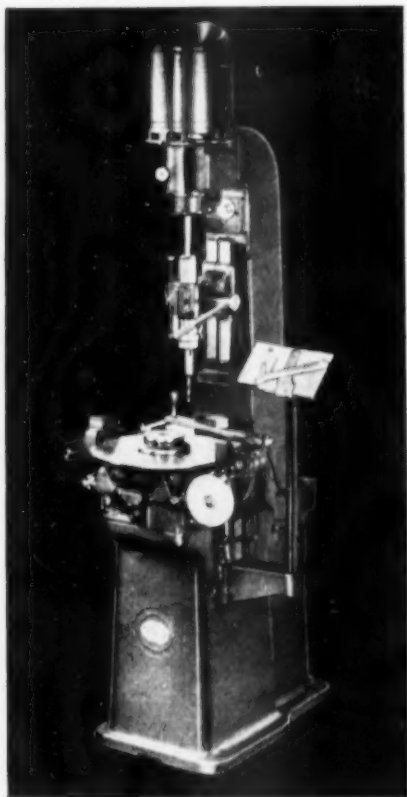
Where production permits special machines are being used. The one shown on this page replaced 40 standard tools operating at 69 stations. In two stages, on this machine, there are 71 operations and 134 tools in action.

**T**HIS MACHINE TOOL SECTION is arranged for quick reference. The types of the machines are arranged alphabetically. On each spread the Classification, its Symbol, and Definition are given. The machines included in any classification are examples, not a complete list of all makes. For that reason, we have reproduced them as given in the General Motors Uniform Machine Tool Classification.

**Symphony in Tool Engineering—154 feet long—automatic operation—composed of 33 separate machines.**  
Courtesy of Wright Aeronautical Corp.



# BALANCING MACHINES



Gisholt Static Balancing Machine for measuring and correcting the unbalance of parts like flywheels and drums.



Static Balancing of flywheels on Ideal Balancing Way. Adjustable for length of work, swinging up to 60" diameters.

Below. Typical application of a balancing machine in an automotive plant. (Dodge)



Micro-poise Balancer used for airplane propellers made by Commerce Pattern Foundry & Machine Company.

★ ★ ★ ★ ★ ★ ★ ★

## A-1-1—BALANCING MACHINES—HORIZONTAL—DYNAMIC

Include machines designed for dynamically balancing revolving parts or elements such as rollers, fly-wheels, propeller shafts, drive shafts, wheels, etc., where the axis of rotation is in a horizontal plane.

Akinoff—Olsen—Gisholt  
General Motors—Norton—Globe

## A-1-2—BALANCING MACHINES—HORIZONTAL—STATIC

Include machines designed for statically balancing revolving parts or elements such as rollers, fly-wheels, propeller shafts, drive shafts, wheels, etc., where the axis of rotation is in a horizontal plane.

Akinoff—Olsen—Gisholt  
General Motors—Norton—Globe

## A-2-1—BALANCING MACHINES—VERTICAL—DYNAMIC

Include machines designed for dynamically balancing revolving parts or elements such as rollers, fly-wheels, propeller shafts, drive shafts, wheels, etc., where the axis of rotation is in a vertical plane.

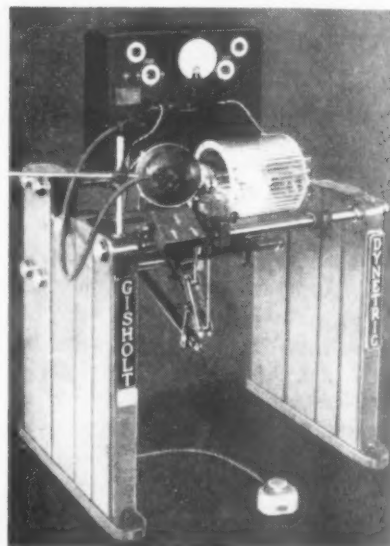
General Motors—Commerce Pattern—"Wheel"

## A-2-2—BALANCING MACHINES—VERTICAL—STATIC

Include machines designed for statically balancing revolving parts or elements such as rollers, fly-wheels, propeller shafts, drive shafts, wheels, etc., where the axis of rotation is in a vertical plane.

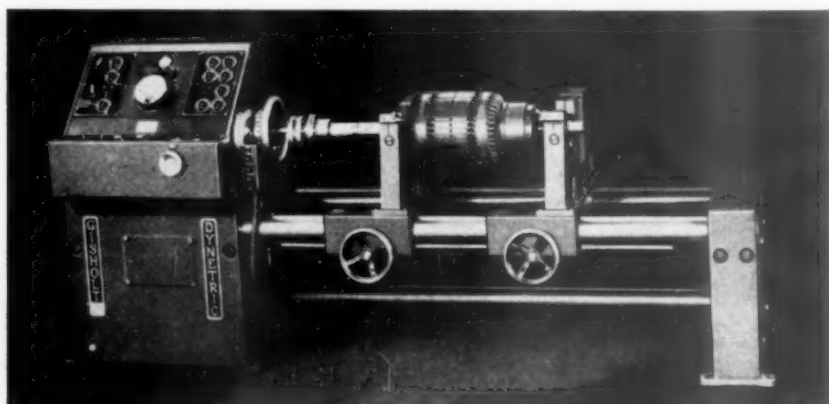
General Motors—Commerce Pattern—"Wheel"

★ ★ ★ ★ ★ ★ ★ ★

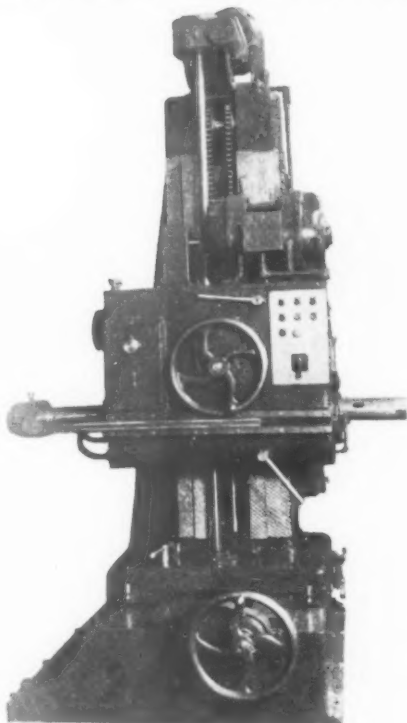


Above. Dynetric Balancing machine, Gisholt type S. For measuring unbalance of complete assemblies while rotating.

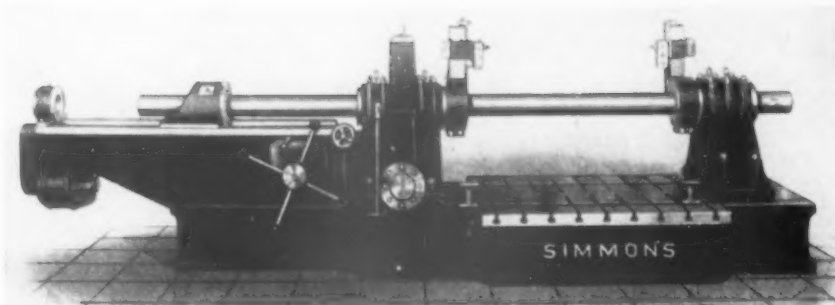
Below. Measuring unbalance of heavy rotating parts on a Gisholt Type C machine.



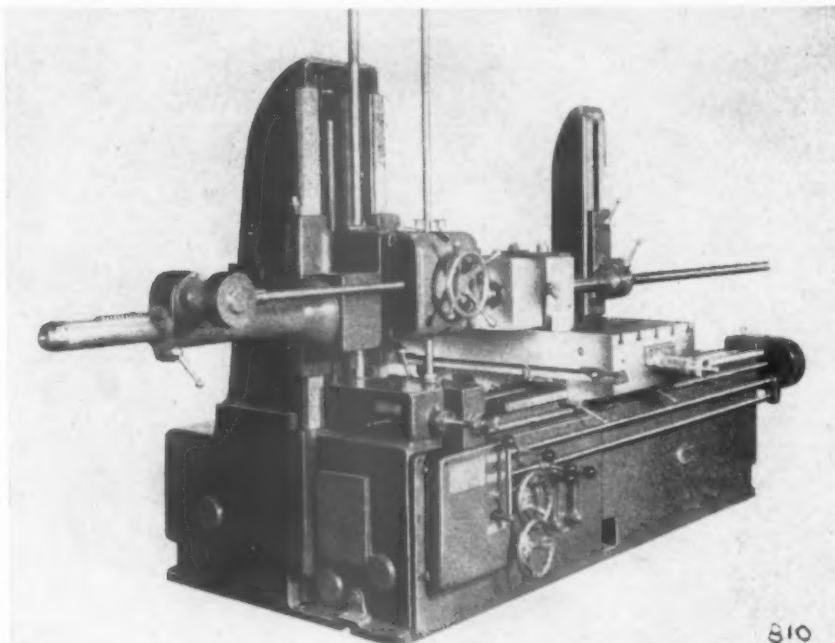
# BORING MACHINES



Above. Moline Horizontal Hydraulic Type Boring Machine.



Simmons 6 inch Bar, Horizontal Boring Machine with 17 foot bar and widened center section. Has infinitely variable feed.



Latest Yoder Horizontal Type Boring Machine. Has synchronized Vernier scales on head, column and outer support. 24" x 48" table with 52" travel and 16" cross feed. Spindle adjustable 29" vertically.

★ ★ ★ ★ ★ ★ ★ ★

## B-1—BORING MACHINES—HORIZONTAL

Include horizontal machines, the purpose of which is to enlarge a cylindrical hole previously drilled, or a cored hole, as usually done with a single point tool, boring bar, boring head, etc., but do not include precision boring machines or jig boring machines.

Baker No. 25HH, Double End	For
Baker No. 3, Double End	Giddings & Lewis, No.
Baker No. 8HH, Double End	30, 25RT, 560T, 350,
Baker No. 4HH, Double End	330T, 0, 340.
Baker No. 4, Double End	Lucas No. 31
Baker No. 6HH, Double End	Rockford
Baush	Sellers Nos. 4HT, 5HT,
Defiance Nos. 25A, 26A	6HT, 6HF
Jones	Ohio-Bench No. 55-
Ohio-Floor Nos. 5-F-420,	430, 5T-600, 5T-60A,
5FA, 6FA	6T-60-A

## B-2-1—BORING MACHINES—VERTICAL

Include vertical machines, the purpose of which is to enlarge a cylindrical hole previously drilled, or a cored hole, as usually done with a single point tool, boring bar, boring head, etc., but do not include precision boring machines or jig boring machines or vertical turret lathes or vertical boring mills.

Baker Nos. HO, 30HO	Ingersoll, 6-sp. & 8-sp.
Baush	Cylinder Borer
Bullard	Moline, Nos. 13, 14, 101
Colburn	Davis & Thompson
Footo Burt, 6-sp. & 8-sp.	Natco "Holesteel" Nos. 2,
Jones	3, 4, 5
John E. Livingstone	

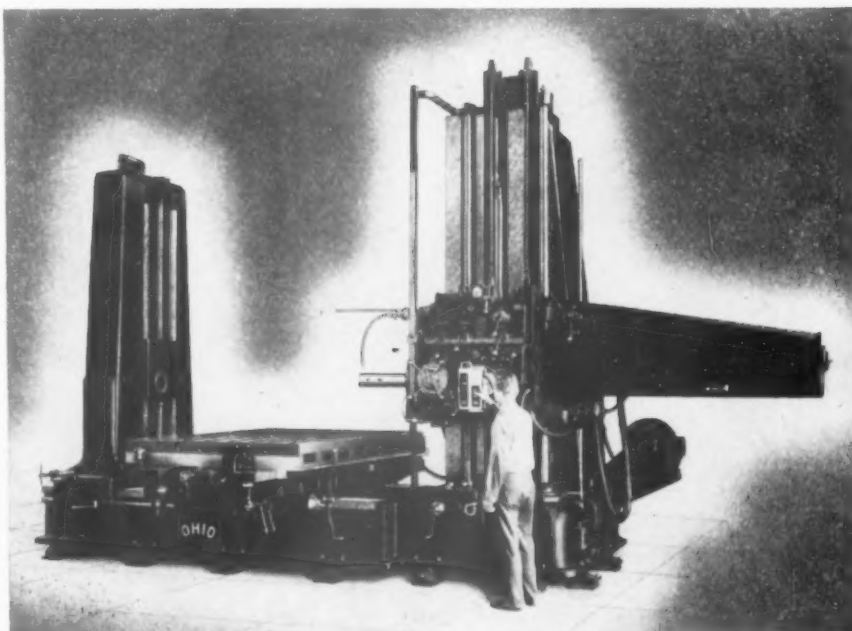
## B-2-2—BORING MILLS—VERTICAL

Include all machines that have revolving type vertical table with diameter larger than the diameter of the table of vertical turret lathe. See VERTICAL TURRET LATHES No. N-2.

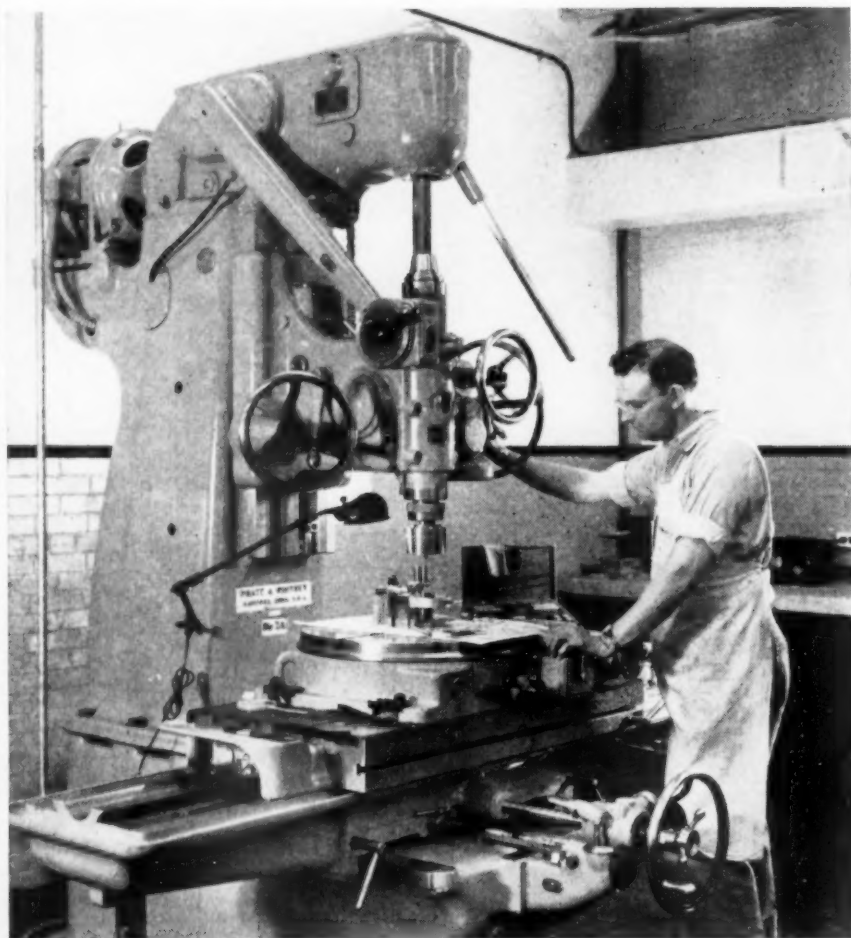
King-Bullard-Niles-Bement-Pond

★ ★ ★ ★ ★ ★ ★ ★

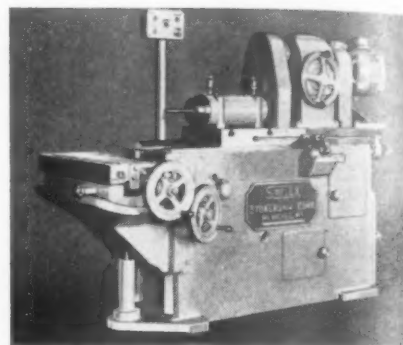
Large horizontal boring machine built by Ohio Machine Tool Company. 96" vertical travel of boring bar.



# BORING MACHINES Special Precision



Pratt & Whitney Jig Borer operating in the air conditioned tool room of the Merz Engineering Co., Indianapolis, Ind. This machine is considered one of most accurate for this very important kind of work.



Simplex Horizontal Precision Borer built by Stokerunit Corp. It has vertical, longitudinal horizontal and traverse table movement which permits wide range of action at one setting.

★ ★ ★ ★ ★ ★ ★ ★

## B-4-BORING MACHINES—SPECIAL

Include in this "Special" class those machines which are designed for a special purpose and which cannot be readily adapted to another job. Every reasonable effort should be made to place each machine in one of the "Standard" classes. If a machine is essentially a "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" class and indicate the special attachment by abbreviation "S.A."

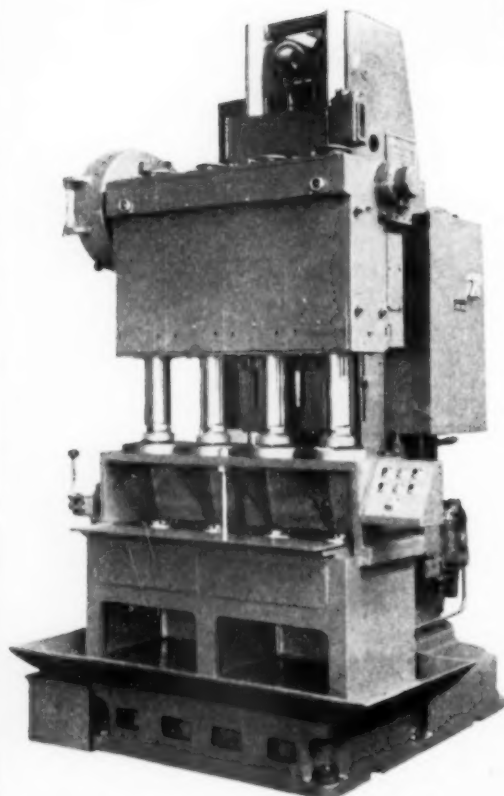
Enterprise  
Excella  
Foote-Burt  
Fitchburg  
Kreuger  
Nateo  
Kingsbury

Heald  
Greenlee  
Le Malre  
Fox  
Baker  
Davis & Thompson  
Nateo

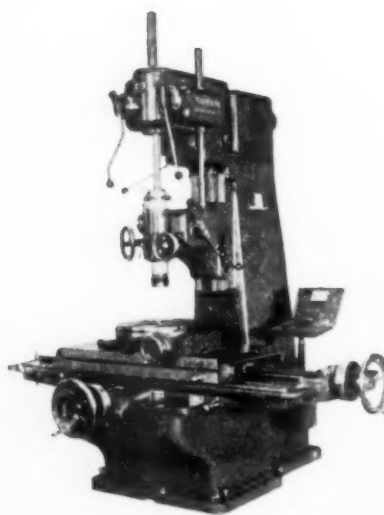
## B-5-BORING MACHINES—JIG

Include all precision boring machines used primarily in tool and die rooms for jig and fixture construction and repair. Do not include precision boring machines.

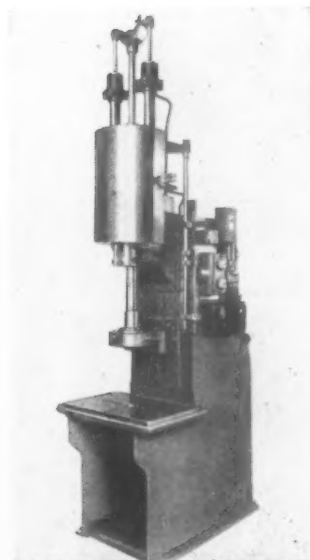
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Vertical cylinder boring machines like this Moline give high production with accuracy.



Cleereman Jig Borer is a type of machine vital to the victory program.

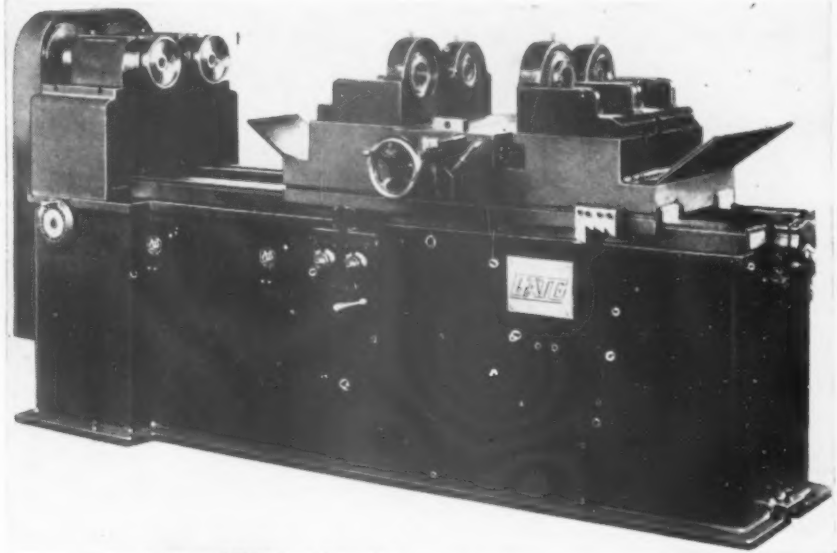


Gatco vertical borer for use with carbide and diamond tools.

# Jig Borers BURNISHING MACHINES



Ex-Cell-O Style 2112 Precision Boring Machine finishing an aircraft part (steel) to close limits and holding distance between hole centers to extreme exactness.



GATCO horizontal type borer built by Giern & Anholtt Tool Co. for high speed precision boring with carbide and diamond tipped tools. Bars piloted on anti-friction bushings.

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Pratt & Whitney Nos. 3, 3B, 2, 1A	Cleereman
Reed Prentice	Fordick No. 30A
Cincinnati-Bickford	Moore
Vernon	Societe Genevoise (Swiss Boring)

## B-6-BORING MACHINES—PRECISION

Include machines, the purpose of which is to finish bore, turn, face and groove, to extremely close limits. Do not include jig boring machines.

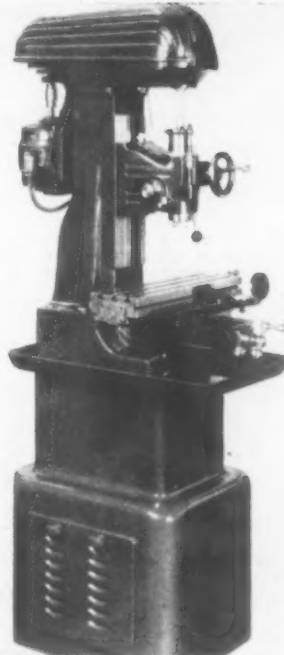
Bausch	Heald Nos. 48A S.E., 47A S.E., 40 S.E. & D.E., 41 and 45 S.E., 49B S.E. or D.E.
Coolter	
Exello Nos. 1212, 2112, 54	
Stokermitt—"Simplex"	

## BA-5-BURNISHING MACHINES

Include machines used to burnish metal to a high finish and accurate size by the use of rolls, balls, or other means of applying pressure to iron the surface.

Moslo-City Engineering

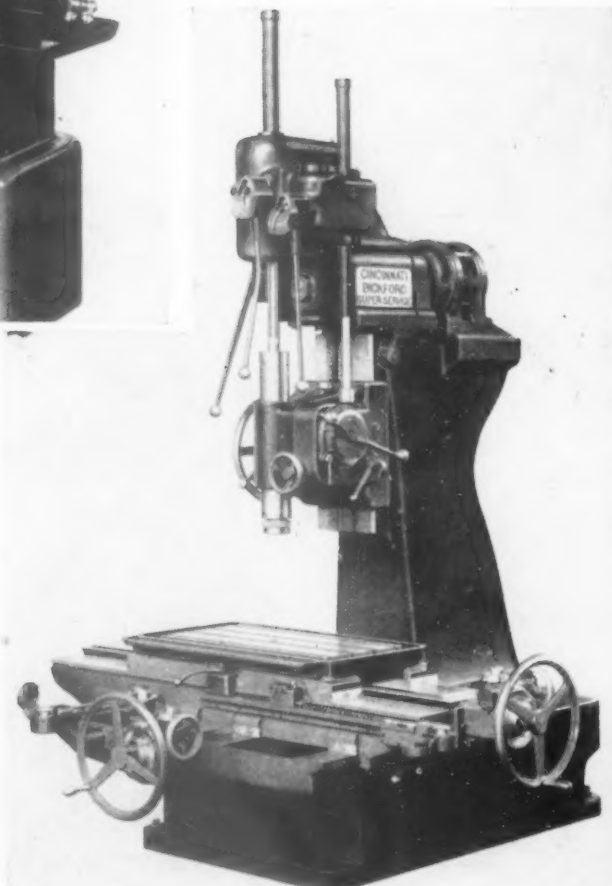
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Vernon Vertical Mill and Jig Borer Machined to very close limits throughout. New micrometer depth stop for greater accuracy.

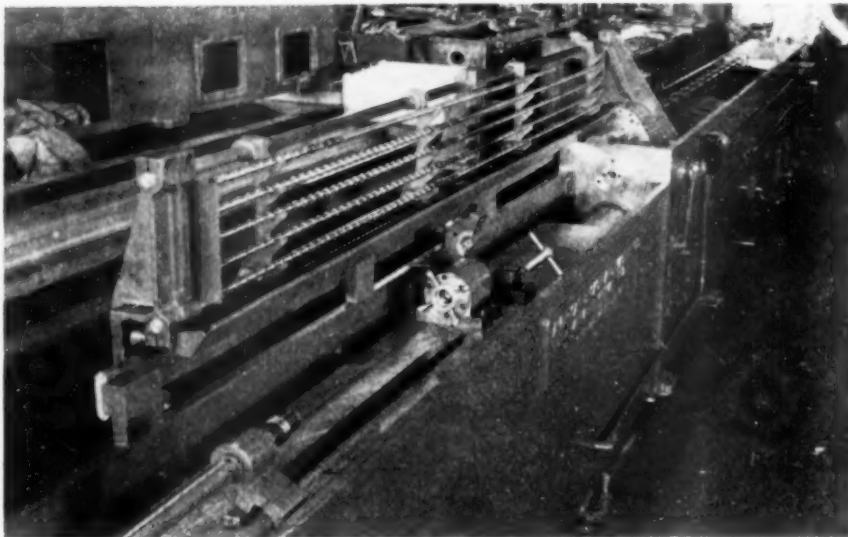


Gorton Super Speed Vertical Mill is used for Jig Boring and Die Sinking. Circular table indexes accurately to 5 minutes.

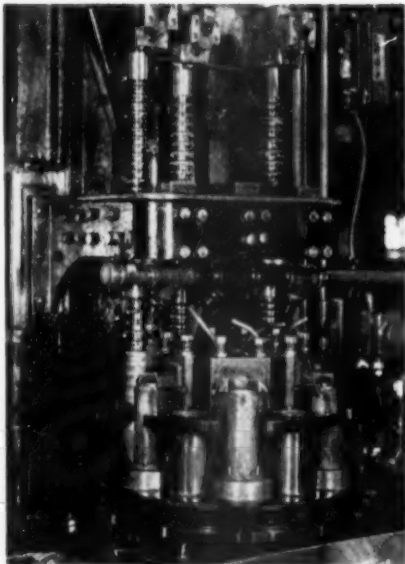


Cincinnati-Bickford produce this Super-Service precision machine for Jig Boring and Drilling.

# BROACHING MACHINES

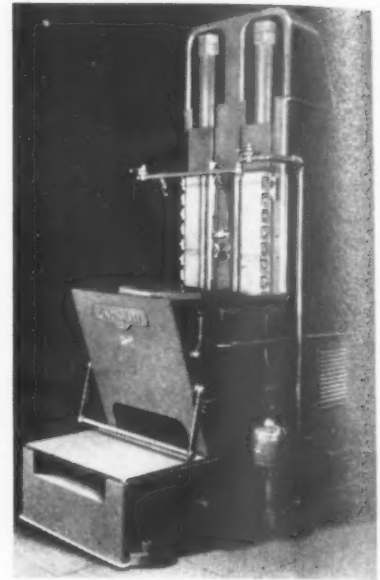
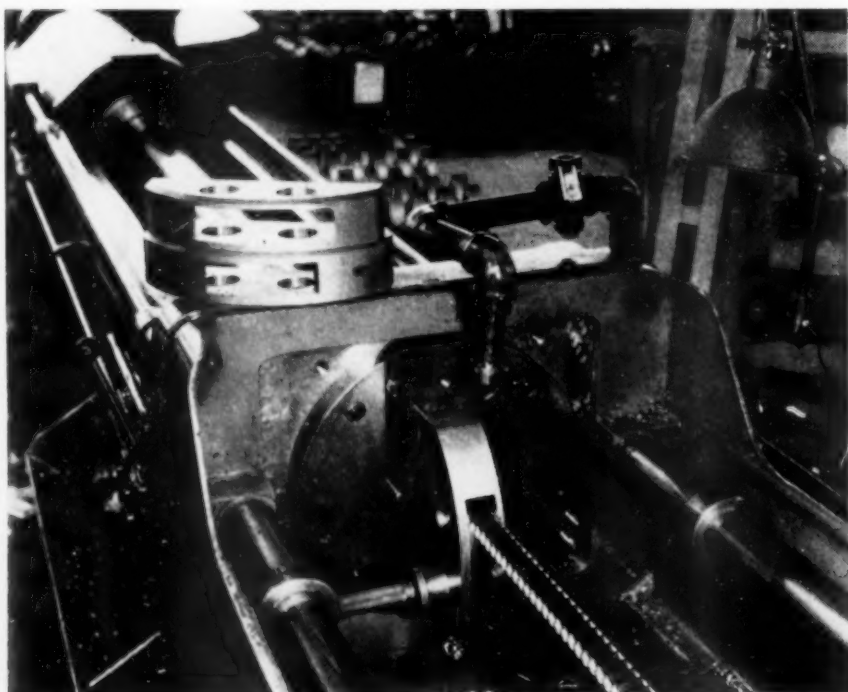


Rifling cannon is the purpose of this horizontal broaching machine made by American Broach and Machine Company. All rifle grooves are broached at one time. Set of four broaches completes the job.



Left. Multiple Broaching — Three pull up broaches operate at one time. Table carries work to each station in sequence. La Pointe Broaching Machine uses Colonial or National Broaches. Machine capacity 40 tons. In operation at Universal Products Co.

Below. Broaching engine crankshaft counter weight. Colonial broaches used. The horizontal broaching machine has a 72 inch stroke and 25 ton capacity.



Cincinnati Duplex Broaching machine increases production. Conserves floor space required. Rams operate alternately so operator loads while one ram is working, thus giving continuous broaching cycle. Full automatic cycle and clamping available.

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## C-1-1—BROACHING MACHINES—HORIZONTAL

Include horizontal machines for broaching, whether mechanical or hydraulic feed. Do not include continuous feed type.

Oilgear Nos. 3, 4, "Twin Ten" XA35, XB12, XL20, XL12	American Nos. H 6-48, 15-60, 20-60
Colonial Nos. HAI-6-48, HAI-10-48	Footo-Burt La Pointe
Dries & Krump	

## C-1-2—BROACHING MACHINES—HORIZONTAL—CONTINUOUS TYPE

Include only horizontal broaching machines which have continuous feed of parts.

Footo-Burt Nos. 5, 10, 12½, 15  
American

## C-2—BROACHING MACHINES—VERTICAL

Include vertical machines for broaching, whether mechanical or hydraulic feed. Do not include automatic vertical broaches. Do not include vertical forcing presses which might be used for broaching.

Footo-Burt 5 ton	Single
Footo-Burt 10 ton	or
Footo-Burt 15 ton	Duplex
Footo-Burt 25 ton	

Colonial Broach  
Cincinnati 5 ton & 10 ton  
Oilgear

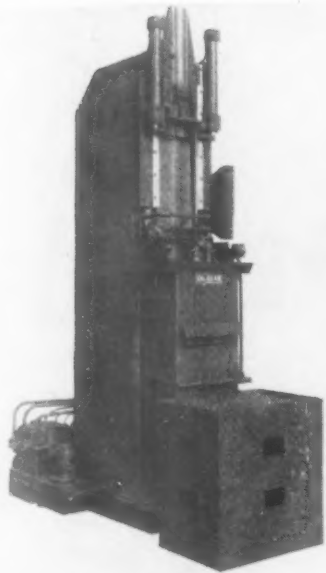
## C-3—BROACHING MACHINES—VERTICAL—AUTOMATIC

Include vertical machines for broaching which have an automatic work cycle, such as "Cyclematic."

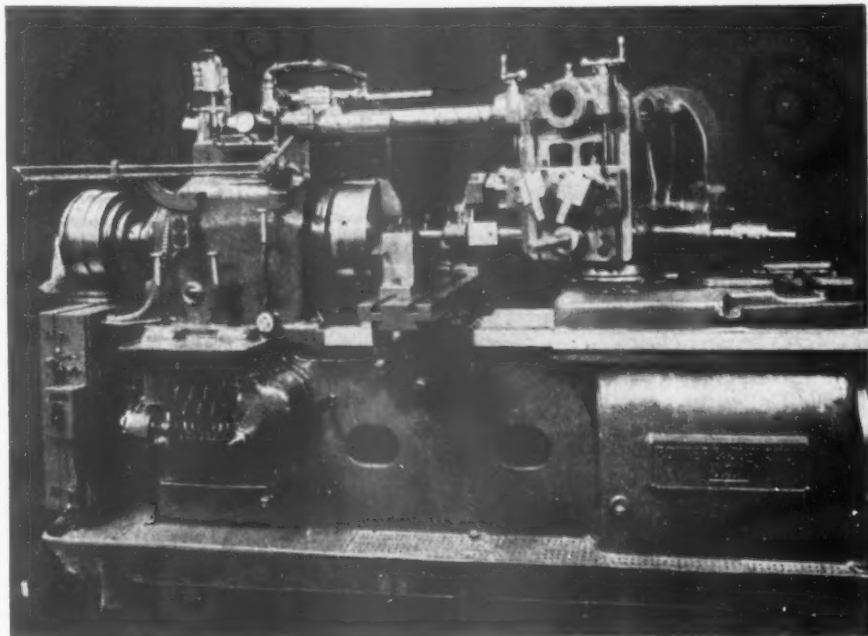
Oilgear "Cyclematic"  
American VP-3, VP-4 & VP-5

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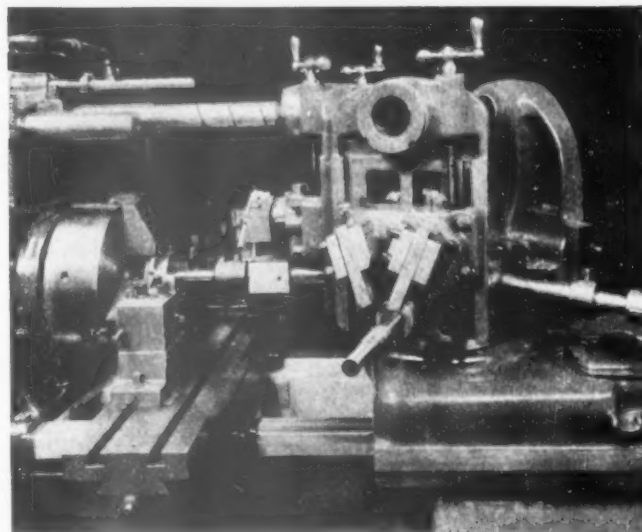
# CHUCKING MACHINES



Oilgear new dual type pull down broaching machine. The above machine used for steering gear housings is a 10 x 54" unit. It has dual safety push button control, automatic work clamping and shuttle tables that feed work. Tables retract after cut



Quickly adjustable tooling and wide range of applications is characteristic of these Powerflex P & J Automatic chucking machines. The whole machine is shown in the upper right hand corner.



Below. One of the many products of Illinois Tool Co. a new design gun broaching machine.

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### C-4—BROACHING MACHINES—SPECIAL

Include in this "Special" class those machines which are designed for a special purpose and which cannot be readily adapted to another job. Every reasonable effort should be made to place each machine in one of the "Standard" classes. If a machine is essentially a "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" class and indicate the special attachment by the abbreviation "S.A."

American

### D-5—CHUCKING MACHINES

Include semi-automatic metal turning equipment which holds the materials being processed in a chuck. Such machines do not have a tailstock. The tools may be fed by an automatic turret and by an automatic tool-slide. Such machines may be a single or multiple spindle. Such machines perform automatically a series or cycle of operations after they are loaded. See also LATHES—TURRET—HORIZONTAL No. N-1, and LATHES—TURRET—VERTICAL No. N-2.

Potter & Johnston

Goss & DeLeeuw

Foster "Fastermatic"

Cone

Jones & Lamson "Fay"

Bullard, "Conti-U-Matic", RD 10" & 14" RDH 14" & 20"

Bullard, "Multi-Au-Matic", J-7"—8 Speed, D-8"—6 Speed, D-16"—8 Speed

Cleveland

Heald

Baird

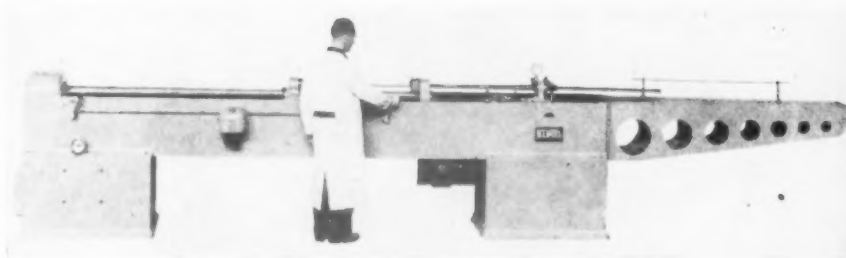
Gisholt, "Simplimatic"

Brown & Sharpe

New Britain—Gridley, Nos. 14, 475, 65, 675, 88, 12A, 23A, 38

National Acme—"Acme-Gridley 6 1/2" RAC—6 spindle, 8" RPA & 12" RPA, 6 spindle; 6" RPA—8 spindle

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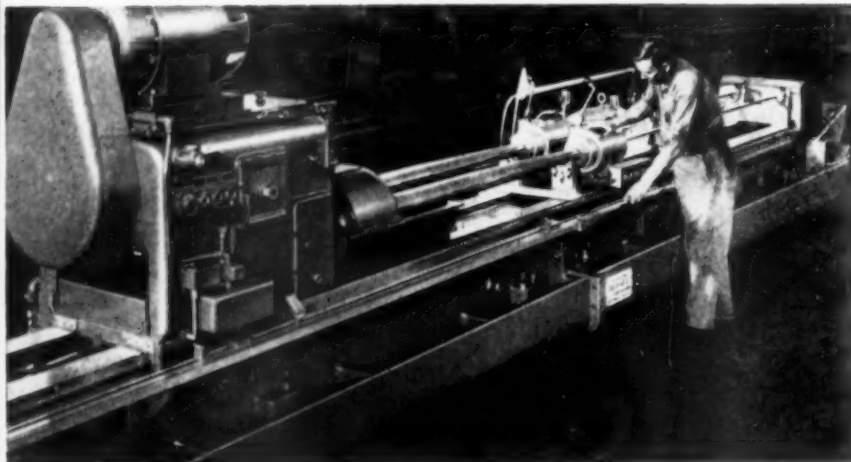


Below. Horizontal type Colonial production broaching machine.

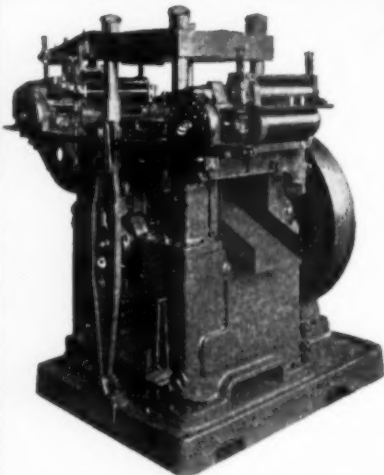


F O R V I C T O R Y

# DRILLING MACHINES



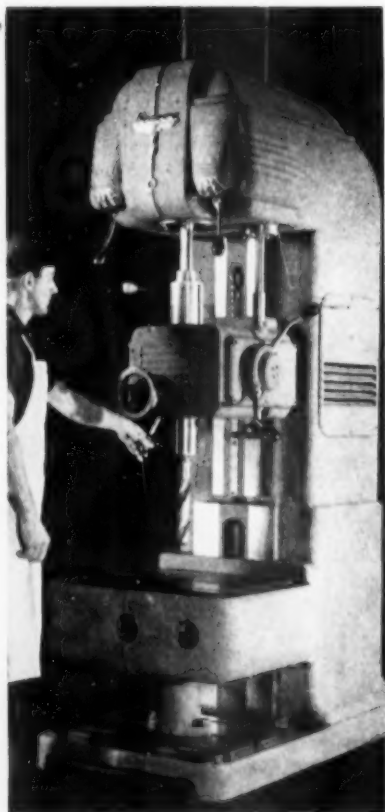
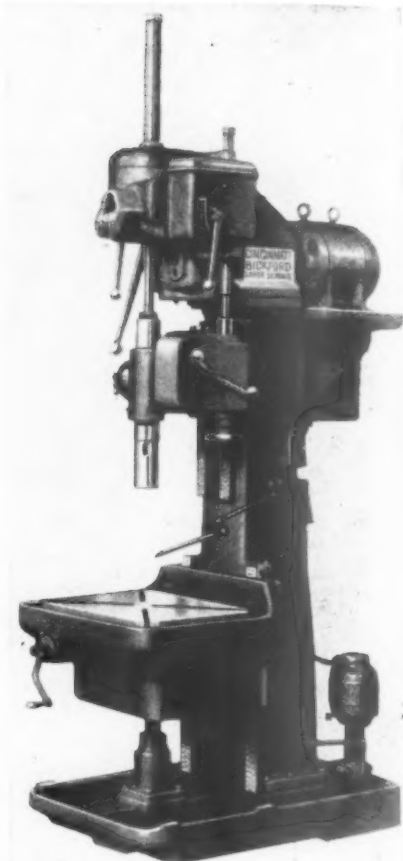
W. F. & John Barnes Double Spindle horizontal drilling machine need only half the floor area. This particular installation increased production 500%.



Dieing Machines like this Henry and Wright perform as many as eight operations at every stroke and produce as many as 4800 finished parts per hour. (Left)

Latest type Super Service Cincinnati Bickford vertical drilling machine. All-g geared type, with hardened spiral bevel gears. Has 24 possible spindle speeds with capacity for 7 1/2 HP motor. (Right)

Latest type of Sibley all-g geared heavy duty vertical drilling machine designed for both toolroom and production work. Shown below, left.



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## DRILLING MACHINES—SPECIAL NOTE:

It is recognized that drilling machines (frequently called drill presses) are a universal machine used for many purposes, such as drilling, reaming, tapping, chamfering, boring counterboring, facing, setting screws and nuts, etc. However, it is desired that regardless of the use to which the machines are being put, all machines designed as drilling machines be classified as such.

It will be noted that two of the classifications of drilling machines are Standard and Special. Standard Drilling Machines are to include general purpose machines, i.e., machines, which with little or no rebuilding (but possibly with changes in drilling heads, chucks, drill-holders etc.), could be used on other work. Special Drilling Machines include all machines designed for production of a specific part, machines designed to drill at a particular angle, etc., e.g., machines designed especially to drill cylinder blocks and crankshafts.

The terms "Unit" or "Units" have been used. By these terms is meant a self-contained device consisting of a motor, a spindle, and a feed mechanism, either mechanical or hydraulic, and to which can be attached multiple-spindle drill heads.

These "Units" can be used single or assembled in various combinations on special and standard bases or frames to permit single or multiple drilling operations.

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The "Units" may be detached from their bases temporarily for storage.

In connection with drilling machines, it is necessary to know the number of spindles, the number of such spindles equipped with tapping attachments. Therefore, indicate the number of spindles; indicate the number of spindles equipped with power feed by the abbreviation "P.F." following the proper number; and indicate the number of spindles equipped with tapping attachments by the abbreviation "T.A." following the proper number, e.g., No. 2 Fostick, 6 Sp., 4 P.F., 2 T.A.

If a drilling machine is equipped with a reversing motor, do not let that circumstance alone result in classification of "tapping attachment."

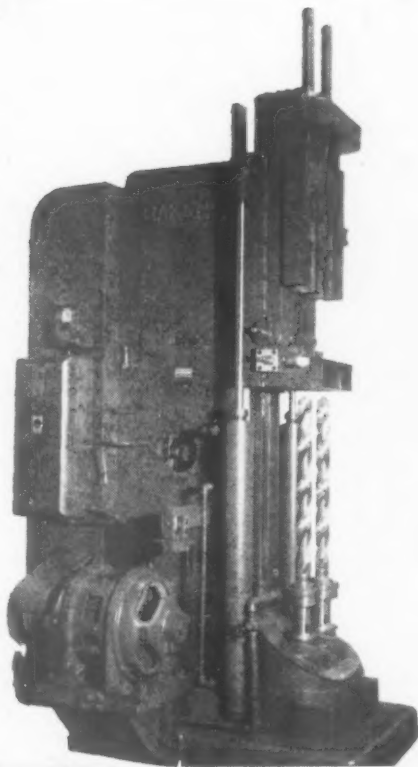
Gang drills are classified as Standard. Gang drills are drills on which two or more spindles are arranged in a line on the same base.

A multiple-spindle drilling machine is a machine, which because of its design, is intended to be used only with cluster type adjustable spindles, or a machine equipped with a platen to which can be fitted special design multiple spindle heads.

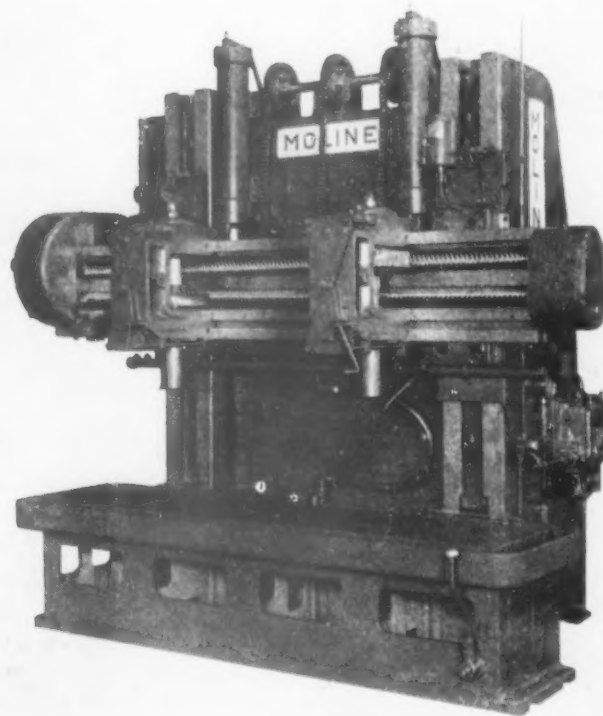
If the drilling machine is of the bench type, write the word "Bench" after it. If the machine is of the floor or pedestal type, no comment is needed.

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# DIEING and DIE SINKING MACHINES



Vertical type, inverted drill for aircraft deep hole drilling. Made by Baker Bros. Saddle has 52" travel. Motor capacity up to 30 HP for heavy duty production. Double production from floor space of one machine



Moline vertical adjustable head drilling machine.



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## FF-5—DIEING MACHINES

Include machines similar in operation and purpose to punch presses, but with flywheel, crankshaft below punch holder.

Henry & Wright

## G-5—DIE SINKING MACHINES

Include machines used to form cavities in forging dies, coining dies and molds, etc.

Billings & Spencer—Pratt & Whitney  
Oliver—Gorton Nos. 6D, 8½D, 9J

## H-1-1—DRILLING MACHINE—STANDARD—HORIZONTAL—ONE WAY

Include only machines of one way whose drilling is done in a horizontal plane.

Baker No. 217H—Foote-Burt No. 6 Morse Taper  
Avey—Nabco

## H-1-2—DRILLING MACHINE—STANDARD—HORIZONTAL—TWO WAY—OPPOSED

Include only machines of two ways which are directly opposite, operating in a horizontal plane.

Baker, Nos. 50HH, 25HH, 30, 5, 5A  
Avey—Barnes No. 420—Barnes Duplex—Banoch

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## H-1-3—DRILLING MACHINE—STANDARD—DEEP HOLE—HORIZONTAL

Pratt & Whitney (Gun Drill)  
LeBlond No. 1½, 1¾ Dia. Drill; No. 2, 3" Dia. Drill;  
No. 3, 6" Dia. Drill  
Morey—Avey—Nabco

## H-2—DRILLING MACHINE—STANDARD—DEEP HOLE—UPRIGHT (VERTICAL)

Pratt & Whitney (Gun Drill)  
Leland & Gifford (Pecker Drill)  
Avey—Edlund—Deffance

## H-4—DRILLING MACHINES—SPECIAL PURPOSE

Include drilling machines which do not fall into classifications of Standard or other machines listed above. Include in this "Special" class those machines which are designed for a special purpose and which cannot be readily adapted to another job. Every reasonable effort should be made to place each machine in one of the "Standard" classes. If a machine is essentially a "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" class and indicate the special attachment by the abbreviation "S.A.". Include machines built up specially for two, three, and four way and angular drilling.

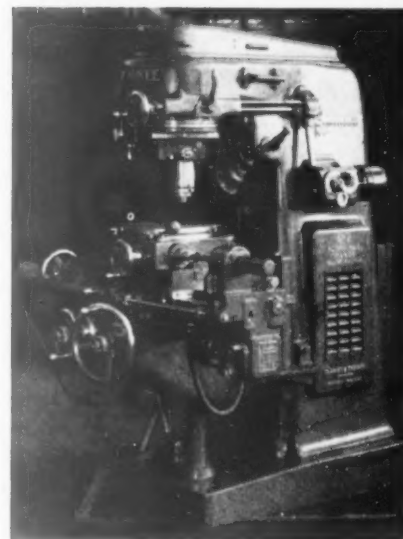
Foote-Burt  
Barnes Nos. H-2, H-3, H-4  
Snyder  
Rehnberg Jacobson  
Kingsbury

Greenlee  
Morris  
Sommer & Adams  
Le Maître  
Nabco

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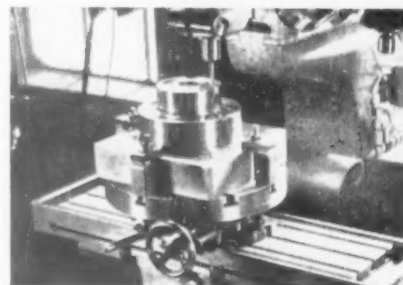
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MARCH, 1942

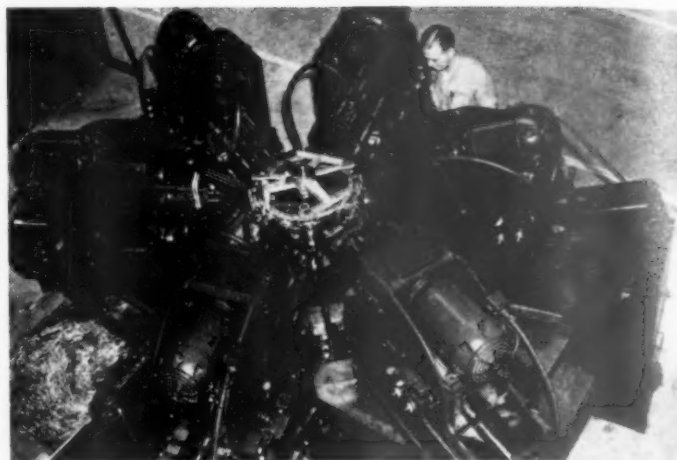
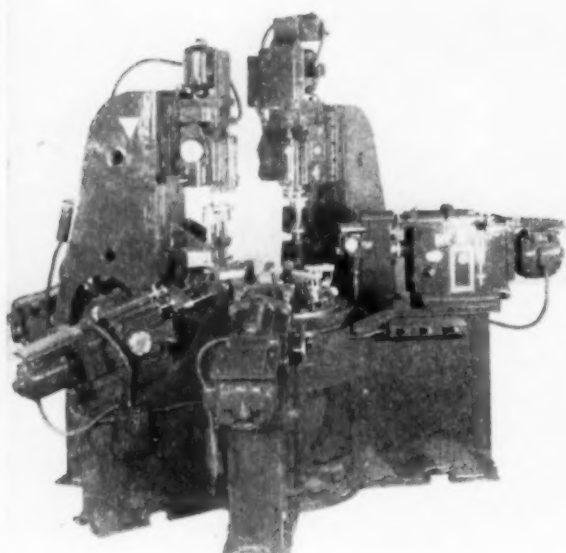


Kearney & Trecker Milwaukee vertical milling machine used for die work.

Die Sinking on a Gorton Super-Speed vertical mill having a 15" circular table.



## DRILLING MACHINES



EMPCO drilling units are entirely automatic with interlocking and central controls.

Here is one machine that does the work of 8 in one tenth the time according to user. Photo courtesy Wright Aeronautical Corp.



Thor air drills speed up production where the drill must be taken to the work.

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H-5—DRILLING MACHINES—STANDARD—  
WITH CHUCK

Include Standard drills with drill chuck fitted to spindle directly. (No Standard Taper.)

Avery Nos.  $\frac{1}{2}$ , 1, 1 $\frac{1}{2}$ , MAS  
Burke No. 1, 1 Sp., No. 0, 1 Sp.  
Delta, 1 Sp.  
Foote-Burt "Sipp" DE, 1, 2, 3, 4 & 6 Spindles  
12" Buffalo, 1 Sp.  
10" Buffalo, 1 Sp., 1 P.F., Bench  
No. 1 Fosdick, 4 Sp., 2 P.F.  
No. 2 Fosdick, 6 Sp., 1 P.F., 1 T.A.  
Demco

H-6—DRILLING MACHINES—STANDARD—  
NO. 1 MORSE TAPER

Include Standard drills of only No. 1 Morse Taper.

10" Buffalo, 1 Sp.  
No. 1B Edlund, 1 Sp.  
No. 1B Edlund, 2 Sp.  
No. 1B Edlund, 4 Sp., 2 P.F.  
Avey, 3 Sp.  
Allen, 6 Sp., 1 P.F., 1 T.A.  
L&G, 4 Sp., 1 T.A.  
10" Buffalo, 1 Sp. Bench  
No. 2 Burke, 1 Sp., Bench  
14" Canedy Otto, 1 Sp.

H.7—DRILLING MACHINES—STANDARD—  
NO. 2 MORSE TAPER

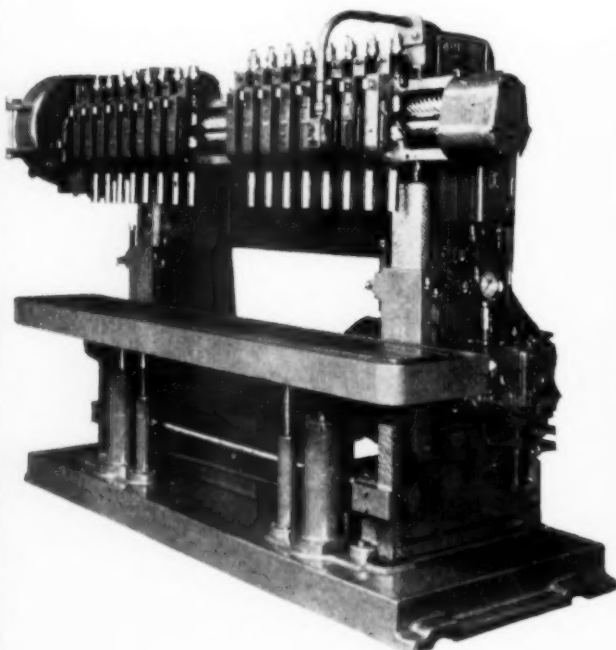
Include Standard drills of only No. 2 Morse Taper.

No. 1 Avey, 1 Sp.  
No. 2 Avey, 4 Sp., 1 T.A.  
Avey, 4 Sp.  
Avey, 2 Sp., 1 P.F.  
No. 2B Edlund, 1 Sp.  
No. 2B Edlund, 3 Sp., 1 P.F., 1 T.A.  
Allen, 4 Sp.  
Allen, 2 Sp., 1 T.A.  
Avey No. MA6, No. 2  
L&G, 6 Sp., 2 P.F., 1 T.A.  
L&G, 1 Sp.  
10" Super, 1 Sp.  
10" Buffalo, 1 Sp., Bench  
14" Canedy Otto, 1 Sp.  
Foote-Burt "Sipp" No. 2—1, 2, 3, 4, 6 Spindles  
Foodick Nos. 4, 4BM  
Demo

### H-8—DRILLING MACHINES—STANDARD— NO. 3 MORSE TAPER

Include Standard drills of only No. 3 Morse Taper.

Arey, Nos. 3, 3 MA6  
20" CO., 3 Sp., 3 P.F.  
Sidd, 2 Sp.  
Sidd, 3 Sp., 2 P.F., 1 T.A.  
No. 4B Edlund, 1 Sp., 1 T.A.  
No. 4B Edlund, 4 Sp., 2 P.F.  
No. 4B Edlund, 4 Sp., 1 P.F., 1 T.A.  
No. 4B Edlund, 4 Sp.  
Footo-Burt Sidd Nos. 3, 1—4 Sp.  
Nateo No. B225H, "Holesteel" No. 2  
21" Cincinnati, 1 Sp., 1 P.F.  
21" Cincinnati, 1 Sp., 1 P.F., 1 T.A.

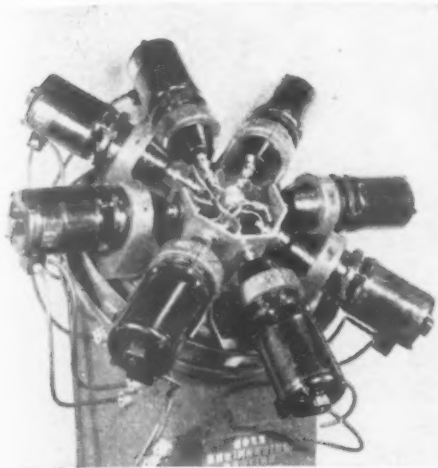


Left. Wide range of set ups can be made with this Moline HD-13 Vertical Driller.



Small sensitive drills like these Delta units can be used to advantage on special set ups like this.

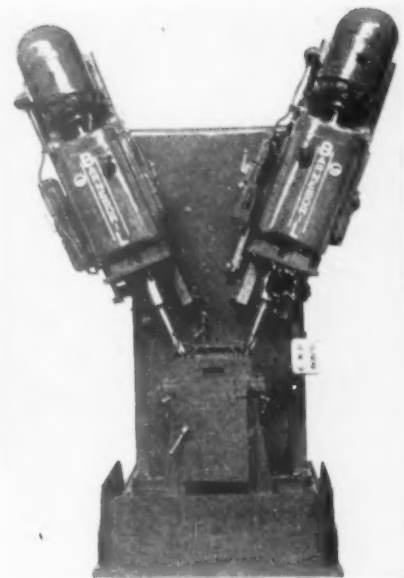
## Special Purpose and Gang Drills



A radial set up of multiple drilling units arranged at various angles on a special machine designed by Hole Eng. Company.



Another multi tool special set up used on an aircraft cylinder head. Photo courtesy Curtis-Wright Co.



**Special 2-Spindle Barnes drill unit.** Each unit is self contained and can be separately adjusted to any angle. They have hydraulic control giving rapid approach, slow feed and rapid return in an automatic cycle. In unit above, each spindle has 12 inch travel and is driven by a 7½ HP motor.

21" Superior, 1 Sp.  
20" Superior, 4 Sp., 4 P.F., 4 T.A.  
No. 5 Fosdick, 6 Sp., 2 P.F., 1 T.A.  
21" Cincinnati DD  
21" Cincinnati SS  
Fosdick No. 5BM  
Demco

H-9—DRILLING MACHINES—STANDARD—  
NO. 4 MORSE TAPER

Include Standard drills of only No. 4 Morse Taper

24" Cincinnati, 1 Sp., 1 P.F.  
24" Cincinnati, 1 Sp., 1 P.F., 1 T.A.  
24" Barnes, 1 Sp., 1 P.F., 1 T.A.  
24" Barnes, 3 Sp., 3 P.F.  
No. 201½ Barnes  
No. 210 Barnes  
No. 221½ Barnes  
No. 242 Barnes  
25" Superior, 1 Sp., 1 P.F.  
25" Superior, 1 Sp., 1 P.F.  
25" Superior, 1 Sp., 1 P.F.  
21" Kokomo Hi-Speed  
25" Kokomo 2, 3, 4, 5, or 6 Sp.  
No. 121 Baker  
24" Cincinnati, 4 Sp., 4 P.F.  
24" Cincinnati, 1 Sp., 1 P.F.  
21" Canada-Otto, 1 Sp., 1 P.F.  
25" Fosdick  
25" Fosdick  
30" Fosdick

No. 21½ Foote-Burt, 1 Sp., 1 P.F.  
No. 2 Foote-Burt, 4 Sp., 4 P.F.  
No. 3 Foote-Burt, 6 Sp., 6 P.F.  
Natco Nos. 2, 3, 4, 5

H-10—DRILLING MACHINES—STANDARD—  
NO. 5 MORSE TAPER

Include Standard drills of only No. 5 Morse Taper

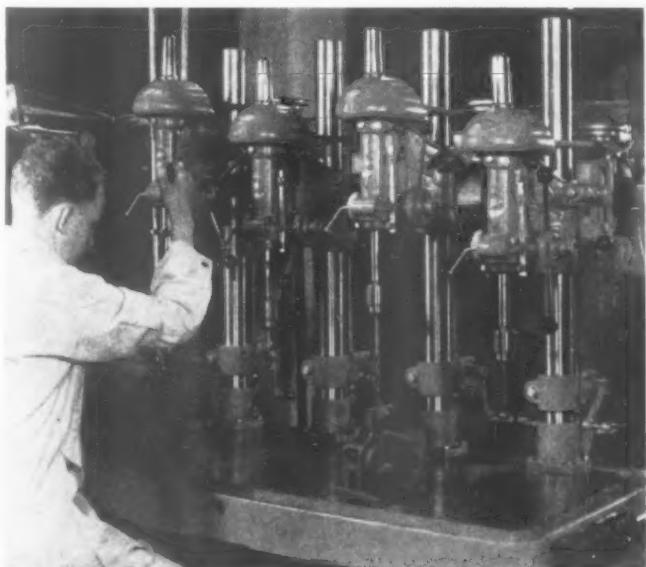
36" Superior, 1 Sp., 1 P.F.  
Colburn, 4 Sp., 4 P.F.  
No. 217 Baker, 1 Sp., 1 P.F., 1 T.A.  
No. 314 Baker, 1 Sp., 1 P.F.  
No. 321 Baker  
Barnes Nos. 242, 262, H-3  
Natco "Holisteel"  
No. 22½ Foote-Burt, 1 Sp., 1 P.F.  
No. 4 Foote-Burt, 4 Sp., 4 P.F.  
No. 5 Foote-Burt, 6 Sp., 6 P.F.  
No. 17 Foote-Burt, 2 Sp., 2 P.F.  
No. 4½ Foote-Burt, 4 Sp., 4 P.F.  
No. 5½ Foote-Burt, 6 Sp., 6 P.F.

H-11—DRILLING MACHINES—STANDARD—  
NO. 6 MORSE TAPER

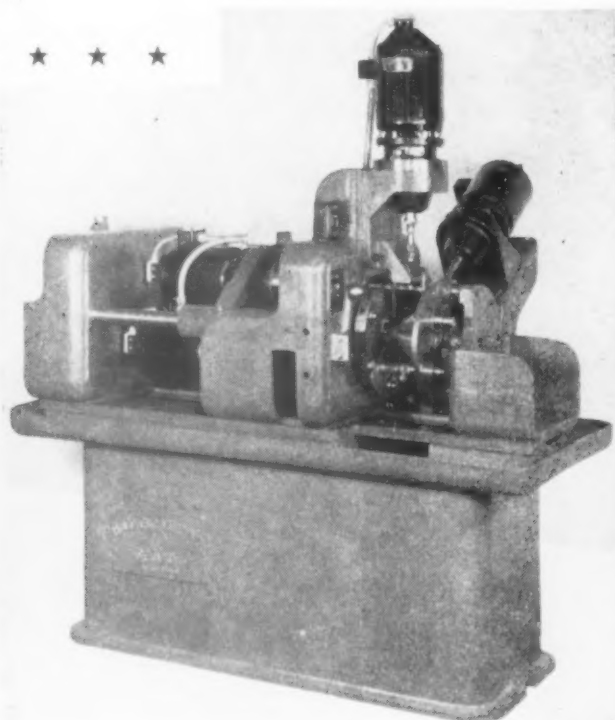
Include Standard drills of only No. 6 Morse Taper

No. 422 Baker, 1 Sp., 1 P.F.  
No. 525 Baker, 1 Sp., 1 P.F.  
Nateo "Holesteel"  
No. 23½ Foote-Burt, 1 Sp., 1 P.F.  
No. H-4 Barnes

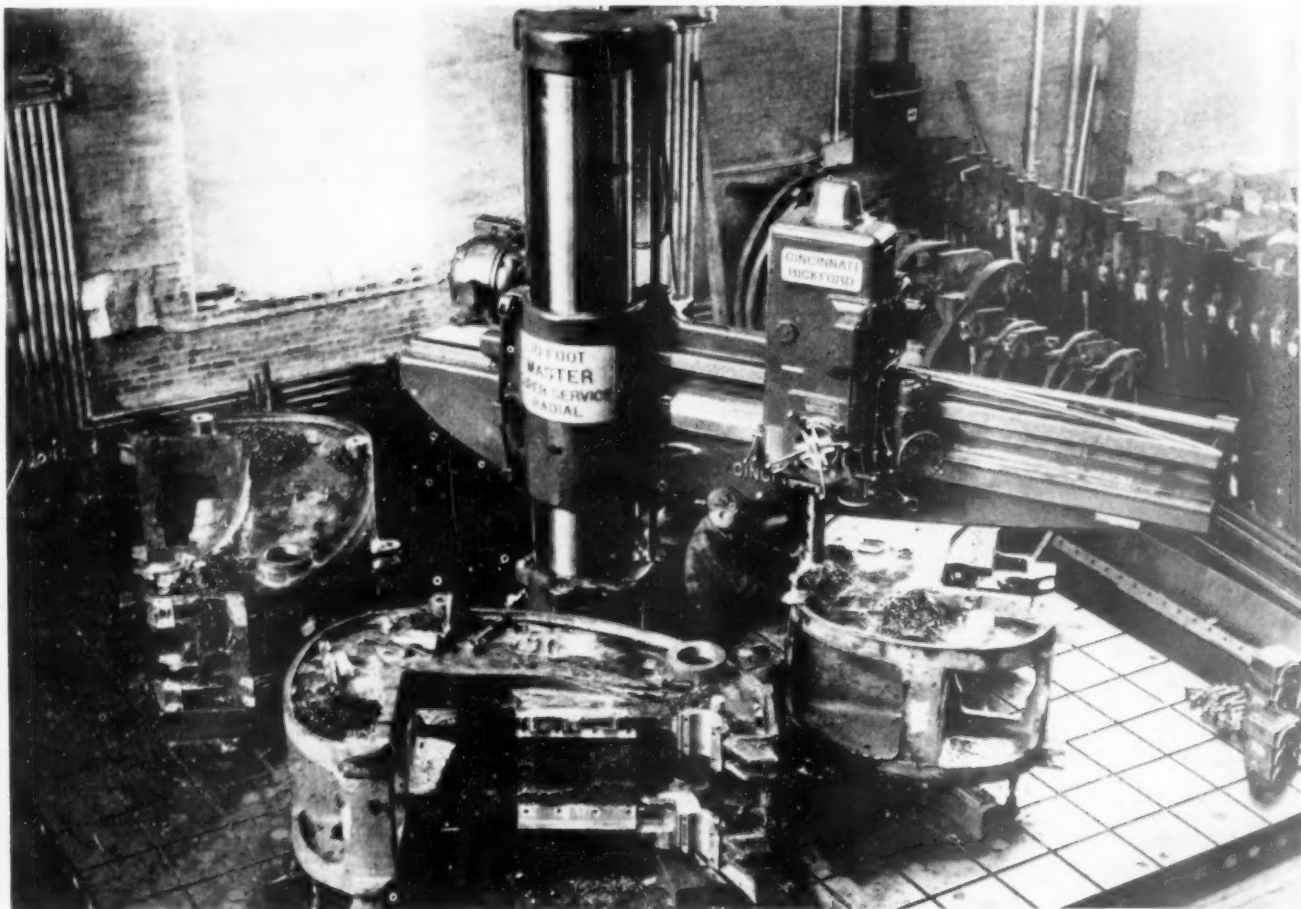
Hole Engineering provides automatic machines that drill holes at all angles. The feed is automatic and the power is applied by a centrifugally governed clutch. This releases taps or drills when stuck.



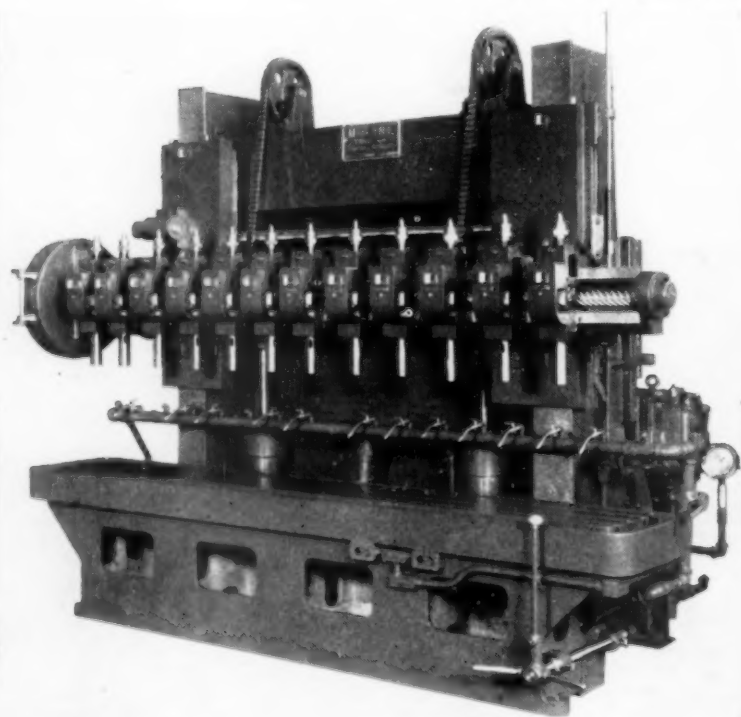
Gangs of Atlas drills simplify numerous operations where different size holes have to be drilled and tapped in a single piece.



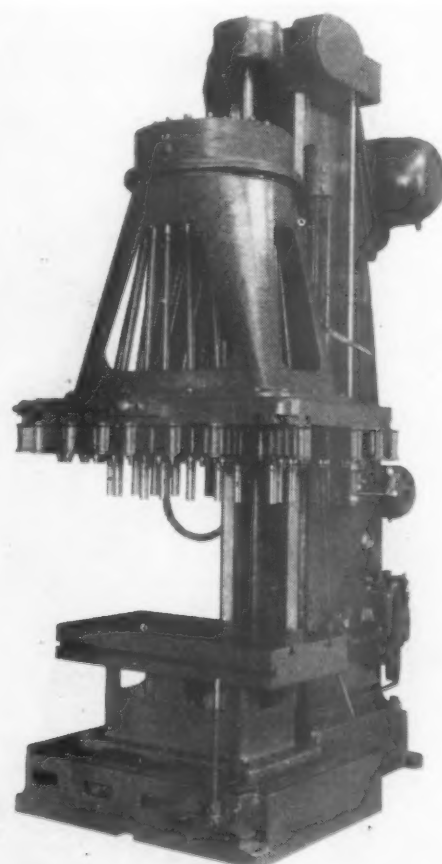
# RADIAL DRILLING MACHINES



Cincinnati-Bickford Radial Drill in service at Niagara Machine & Tool Works, showing how several units can be set up on huge bed plate while drilling proceeds on another piece. The rigidity of the mounting yet the power available and ease of handling make the Radial invaluable for working on heavy castings.

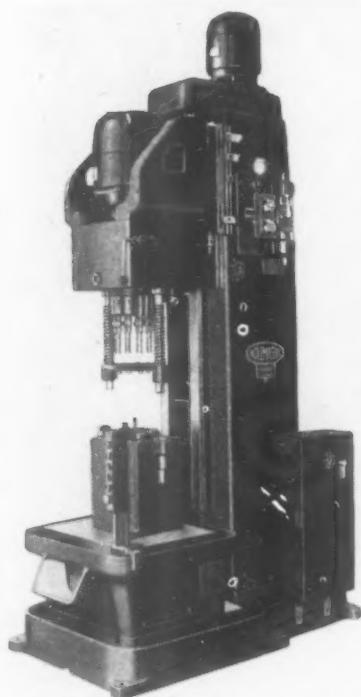


Moline Hole Hog adjustable spindle drilling machines provide maximum adaptability to many different types of work. Hence their use in railway shops, on oil well machinery and in building farm implements.



Heavy duty multiple spindle drilling machines like the Moline, at the right, have 16 adjustable universal joint driven spindles and hydraulic feed.

# MULTIPLE SPINDLE DRILLS



Bradford Vertical Hydraulic Driller and taper with multiple spindle unit head.

★ ★ ★ ★ ★ ★ ★ ★

## H-12—DRILLING MACHINES—STANDARD—MULTIPLE SPINDLE

No. 2 Baush  
No. 15 Fox  
15 Foote-Burt  
15½ Foote-Burt  
16 Foote-Burt  
Morris  
Nateo "Holesteel"  
No. 50H Baker  
No. 25H Baker  
No. E5 Nateo  
No. D6 Nateo  
No. 912 W. F. & John Barnes  
Moline

## H-13—DRILLING MACHINES—STANDARD—RADIAL

Cincinnati Bickford 2½' to 12'  
Cincinnati Portable  
American  
Carlton  
Hammond  
Fosdick 4', 5', 6', 7'  
Drees  
Niles  
Reed Prentice  
Wisconsin  
Western  
Morris

## H-14—DRILLING MACHINES—STANDARD—DRILLING AND CENTERING

Include only machines designed for centering. (This type machine can also be used for double-end hand-feed drilling. In which case, list as a Drilling and Centering Machine.)

Sundstrand Nos. 53, 56  
Cadillac  
Pratt & Whitney  
Rockford  
Allen  
Seneca Falls  
Taft-Peirce  
Whiton  
Avey

## H-15—DRILLING MACHINE—STANDARD UNITS

Include only such units as are not part of a machine, or which may be available in surplus.

Foote-Burt, 1½, 3, 5, 15, 30-HP.  
Nateo  
Avey Nos. ¼, 1, 3  
Greenlee  
Morris  
Baker

## H-16—DRILLING MACHINES—STANDARD FLANGED QUILL

Include machines having a suitable flange on quill for mounting multiple spindle drill heads.

Idefance  
Cincinnati Bickford  
Barnes Drill

## H-17—DRILLING MACHINES—STANDARD—CONTINUOUS

Include machines having several vertical drill spindles which feed continuously as a table supporting work holding chucks revolves with the drill spindles around a center column.

Davis Rotomatic  
Sundstrand

★ ★ ★ ★ ★ ★ ★ ★

MARCH, 1942

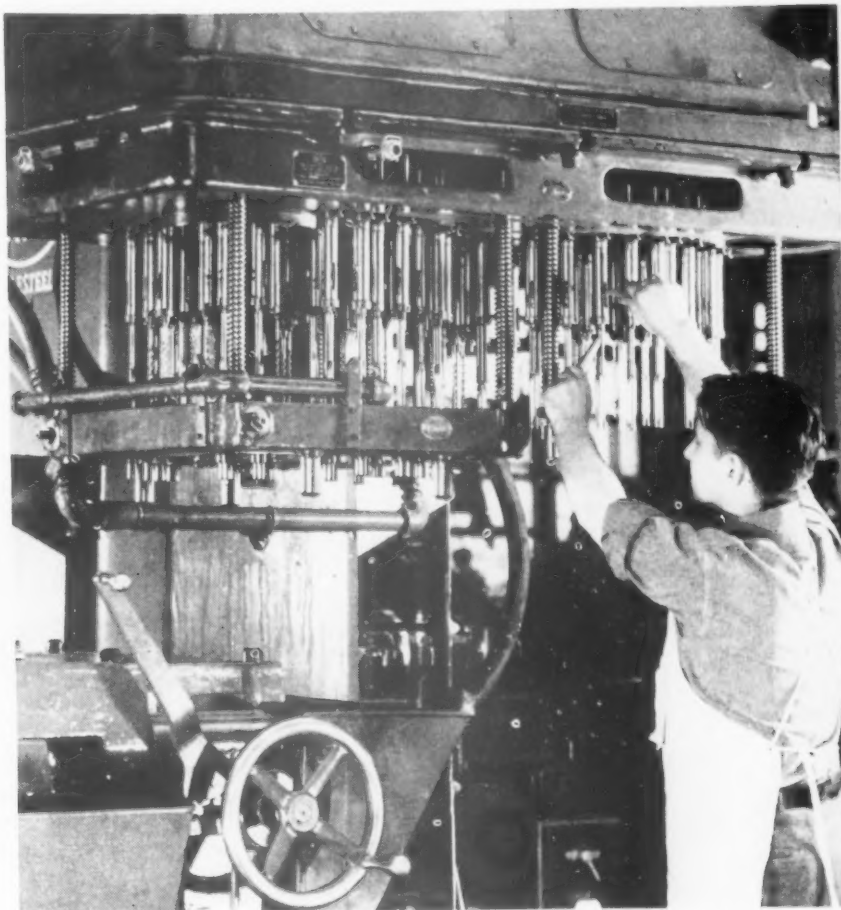
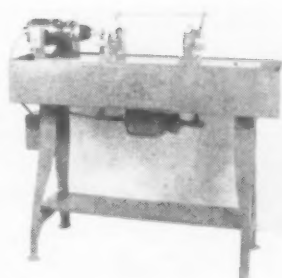


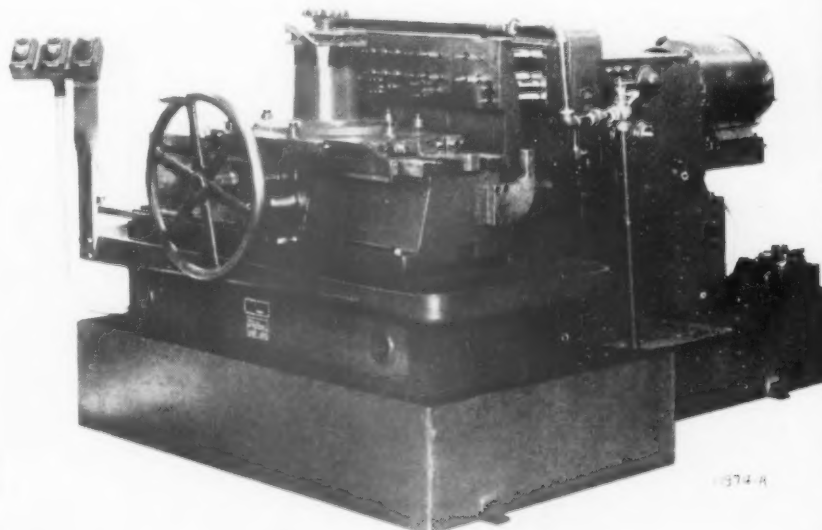
Photo courtesy Curtis-Wright Corp.

Above, Nateo Vertical multiple spindle drilling machine cuts drilling and tapping operation to a minimum.



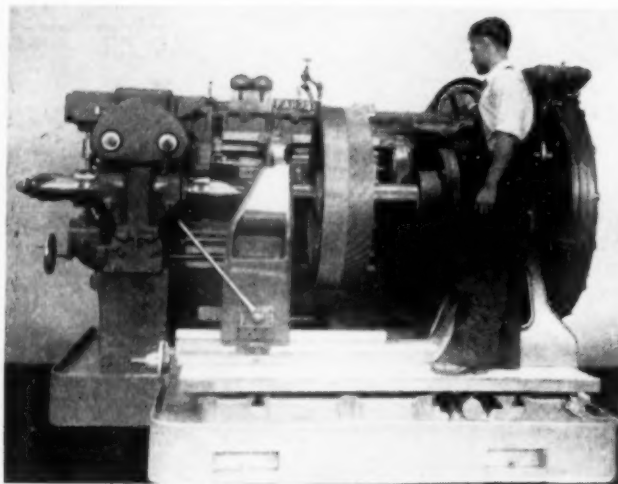
Left, Hole Engineering Company have a center drilling machine which features movable "Vee" blocks that automatically center round work when center drilling.

Below, Baker horizontal multiple spindle drilling machine with hydraulic feed, and multi-operation cross index table.

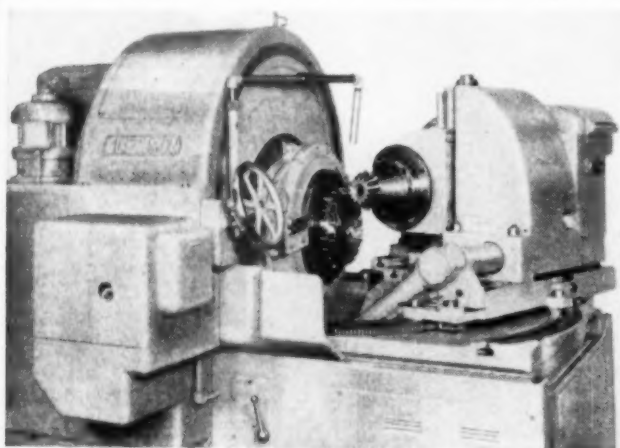


1074-R

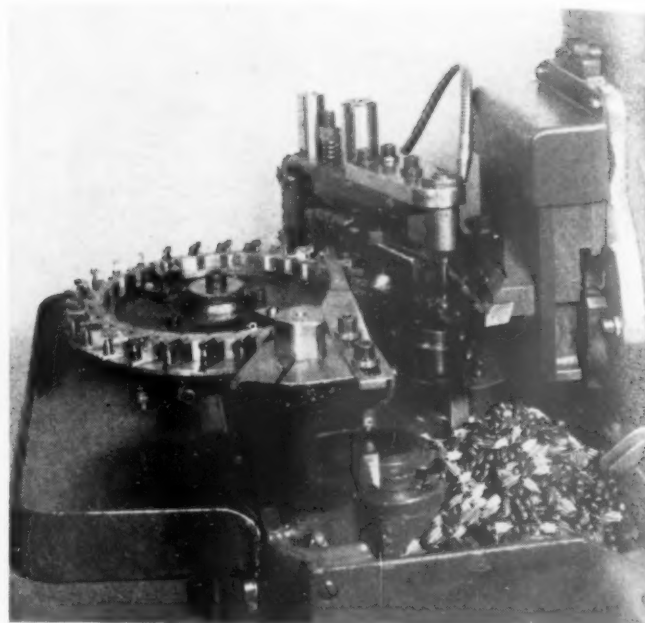
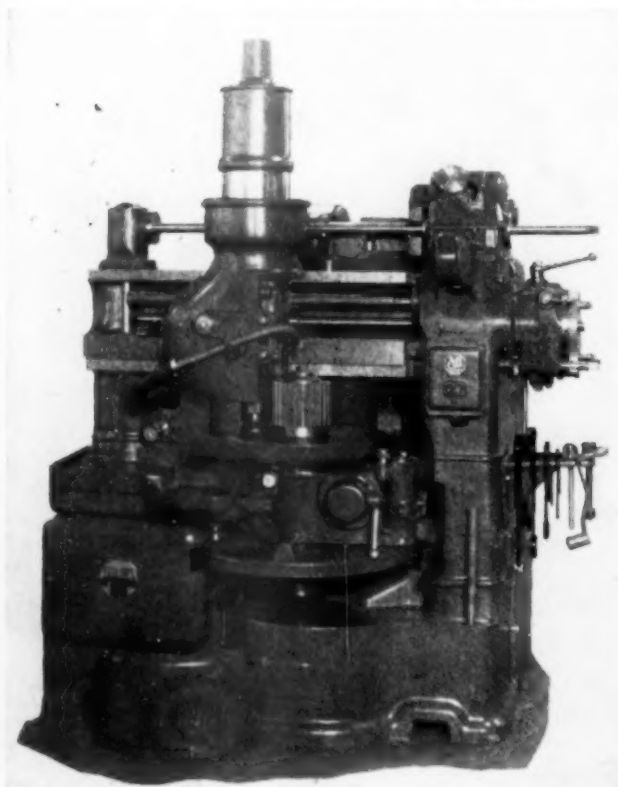
# GEAR CUTTING MACHINES



Latest type Farrell-Sykes gear generator cutting herringbone gears for marine turbine drives. Capacity 1" to 62" diameter, taking up to 18" face double helical and 10" face straight tooth gears.



Above. Gleason gear generator for cutting hypoid gears. Below. Fellows type of gear shaper for cutting spur gears.



Fellows "straight line" gear generator which employs a rack-type cutter and is especially adapted for making fine-pitch gears. Its maximum capacity is 1 1/2" spur and 1" helical gear. With the dial type magazine small pinions can be handled automatically as shown above with great accuracy and at a high production rate.



## J-1—GEAR MACHINES—CUTTING—HOBBERS—HORIZONTAL

Include only machines for hobbing teeth on gears, worm gears, and spline shafts where the work revolves on a horizontal axis.  
Barber Colman, Nos. 3, 12—Lees-Bradner, No. 5A

## J-2—GEAR MACHINES—CUTTING—HOBBERS—VERTICAL

Include only machines for hobbing teeth on gears and worm gears and spline shafts where the work revolves on a vertical axis.  
Gould & Eberhardt, Nos. 8, 12HS, 48HS, 60H, 120H  
Cleveland Universal—Lees-Bradner—Hilton

## J-3—GEAR MACHINES—CUTTING AUTOMATIC

Include only machines on which gears are cut with a single formed cutter and gear is indexed.  
Brown & Sharpe Nos. 3, 6

## J-5—GEAR MACHINES—CUTTING—GENERATORS

Include only machines designed to generate teeth on spiral bevel gears as distinguished from machines using a hob. Do not include thread generators.  
Gleason, 15"—Gleason Nos. 11, 16 Hypoid—Sykes, No. 5A—Bilgram, 6"

## J-6—GEAR MACHINES—CUTTING—RACKS

Include only machines which are designed exclusively for cutting teeth on racks.  
Gould & Eberhardt, Nos. 36R, 60R

## J-7—GEAR MACHINES—CUTTING—SHAPERS

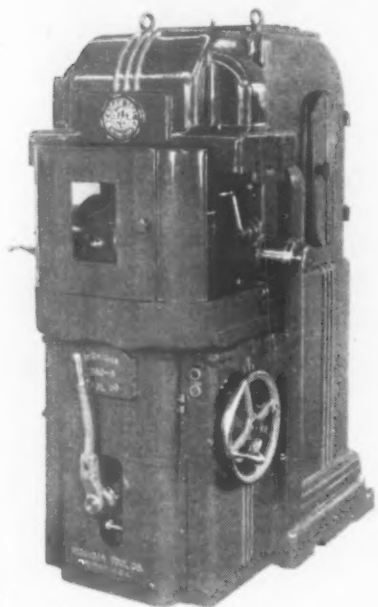
Include machines for cutting internal or external teeth with vertical reciprocating pinion type cutters.  
Fellows, Nos. 77A, 715A

## J-8—GEAR MACHINES—CUTTING—SHAVERS—RECIPROCATING

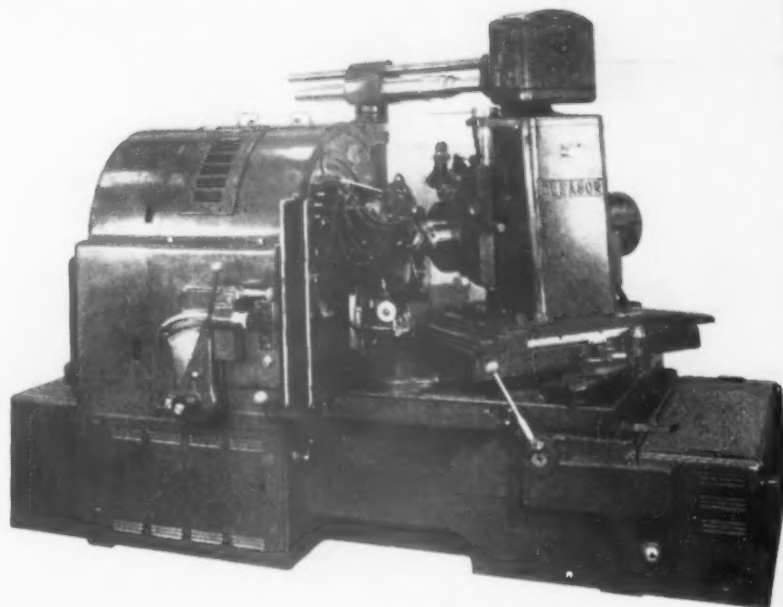
Include only machines for finishing external gear teeth by use of a shaving rack which has a reciprocating motion.  
Michigan Tool



# GEAR FINISHING MACHINES

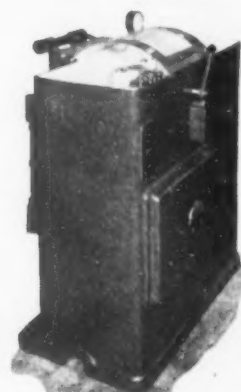
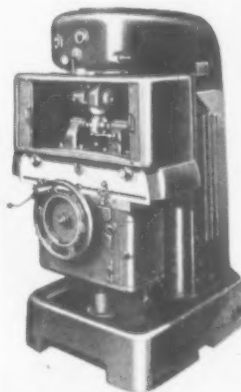


Above. Gear shavers like this are used for finishing the gears used in some of the finest aircraft engines. Close tolerances can be maintained at production speeds. Michigan Tool Co. not only builds these gear shavers but also make large worm gear cutting machines and cuts worm gears as well.



Newest Gleason gear grinding machine for accurately finishing hypoid gears.

Red Ring Heavy Duty Ultra-Precision gear Finishing Machine. →



Below. Newest Fellows gear finisher with push button starting and automatic stopping.

Above. Fellows gear burnisher for finishing small gears which are not to be hardened.



★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## J-9—GEAR MACHINES—CUTTING—SHIVERS—ROTARY

Include only machines for finishing external gear teeth by use of a shaving disc or cutter whose axis is parallel to and revolves with the work.  
National Broach, "Red Ring"—Michigan Tool

## J-10—GEAR MACHINES—CUTTING—TOOTH CHAMFERING OR ROUNDING

Include only machines designed to burr, round, or chamfer teeth on gears.  
Cross, Nos. 62, 73—Bilgram—Lipe—Cimatool

## J-11—GEAR MACHINES—FINISHING—BURNISHING

Include machines for finishing teeth where the work is revolved with suitable mating gear or gears under suitable pressure.

Colonial—Detroit Tap & Tool—Fellows—Gleason—Michigan Tool Co.  
National Broach & Mach. Co.—Pratt & Whitney

## J-12—GEAR MACHINES—FINISHING—GRINDERS

Include only machines designed to grind teeth on gears, splines, etc. Do not include lapping machines.

Detroit—Gleason—Pratt & Whitney, 10"—Gear Grinding Mach. Co. No. GG10—Lees-Bradner, No. 2HS—Fitchburg

## J-13—GEAR MACHINES—FINISHING—LAPPING

Include machines for lapping gears and/or splines.

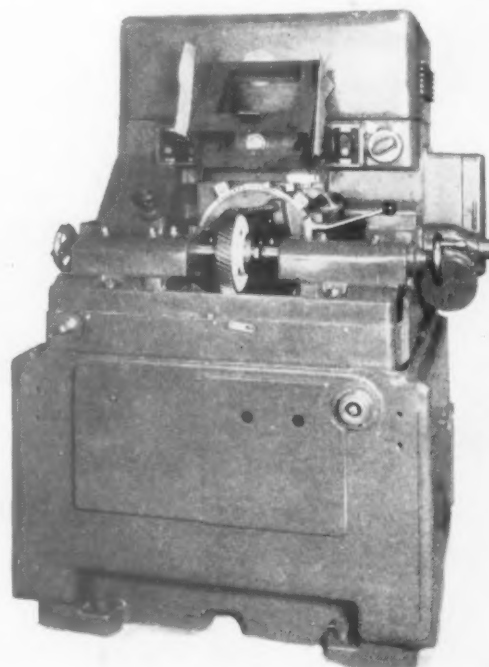
National Broach, "Red Ring"—Michigan Tool—Gleason—Fellows  
Lehman—Marburg—Gear Processing, Inc.—"Incolap"

## J-14—GEAR MACHINES—TESTING

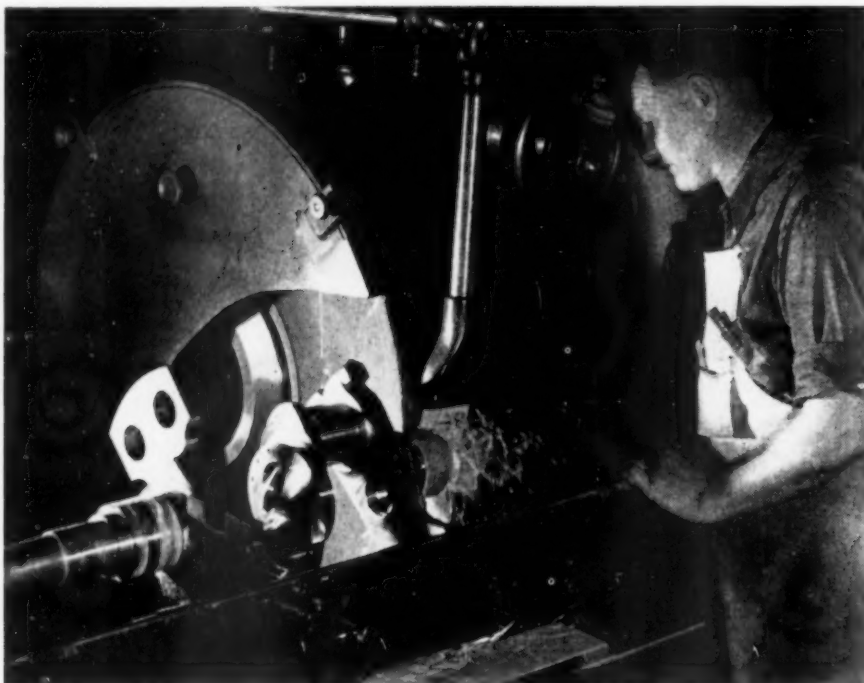
Include machines designed exclusively for checking gears, as to form of teeth, concentricity.

Gleason, 18" Bevel—Jones & Lamson—Fellows  
Gleason, No. 17—Fellows, "Red Lines"—Michigan Tool

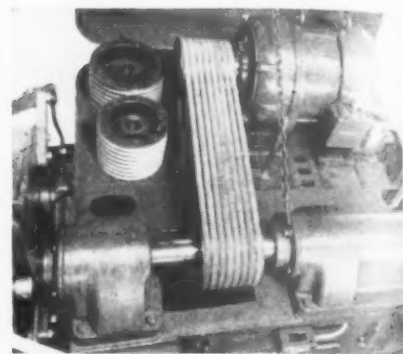
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# GRINDING MACHINES - Tool - Disc - Centerless

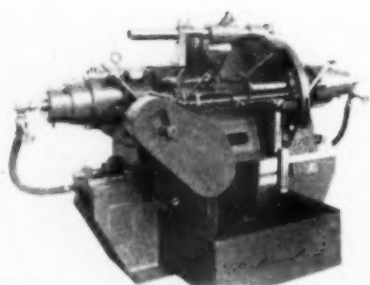


Close up of a Landis crankshaft grinder finishing an aircraft crankshaft at plant of the Ohio Crankshaft Co.

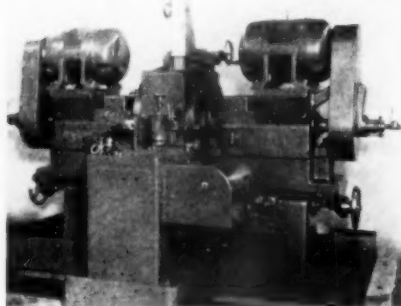


Quick safety grinders speed changes.

Below. Baldr carbide tool grinder.



Besley grinder for finishing thin discs that are automatically fed from dual hoppers.

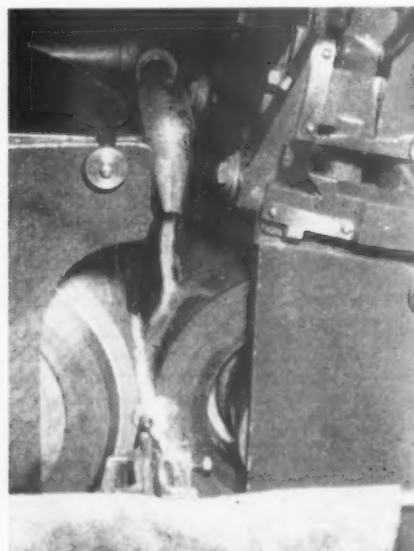
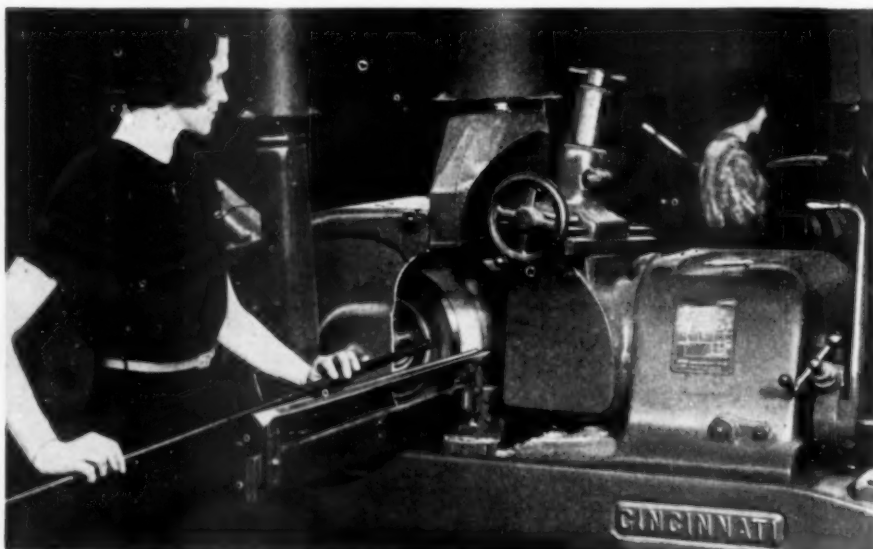


Gardner grinder with double spindles producing tapered bearing cones.



Heald centerless internal grinder shown at work.

Cincinnati Centerless external grinder. The only production machine of this type.



Below. Close up showing a Cincinnati Centerless external cylindrical grinder in action.

# Cylindrical - both external and internal

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## K-5—GRINDING MACHINES—MISCELLANEOUS AND TOOL GRINDERS

Include only miscellaneous grinders such as bench, floor, wet or dry, used for miscellaneous or general-purpose grinding in a machine shop. Exclude hand tools, cycle grinders, flexible shaft grinders, tool post grinders, etc., which are generally classed as expense tools.

United States, No. 20

Delta

Baldor

Cincinnati D.E. 8", 6", 10" bench

Bridgeport

Blount

Hisey-Wolf

Marschke

Sioux

Black & Decker

Hobart

Cincinnati Floor D.E. 6", 8", 10", 12", 14", 18"

20", 24"

Brown & Sharpe No. 10

Hanson

## K-6—GRINDING MACHINES—COMBINATION GRINDER AND DISC GRINDER

Include machines with the standard grinding wheel on one end and a disc grinding wheel on the opposite end.

United States, Nos. 70, 80

Cincinnati S.E. 10", 12", 14", 18"

Gardner 12", 18", 24", 26"

## K-7—GRINDING MACHINES—DISC

Include grinding machines designed for grinding plane surfaces against the flat side of the abrasive disc. There may be horizontal spindle with two wheels or vertical spindle with a single wheel. The machines are not to be confused with "surface grinders" which are precision grinders, whereas disc grinders are essentially rough grinders.

Beasley

Diamond

Gardner, No. 7½

Hammond

Hanchett

Hisey-Wolf

United States

## K-8—GRINDING MACHINES—DISC—DOUBLE SPINDLE—OPPOSED WHEEL

Include machines which are designed for simultaneous grinding opposite sides of a part, e.g., connecting rod crankpin faces.

Hanchett, No. 221

Gardner, Nos. 77A, 84A, 115, 120

## K-10—GRINDING MACHINES—CENTERLESS—EXTERNAL

Include machines for external grinding where the work is not done between centers or in a chuck.

Cincinnati, No. 2, 3, 4

## K-11—GRINDING MACHINES—CENTERLESS—INTERNAL

Include machines other than chucking type internal grinders used for grinding inside diameter only.

Heald, Nos. 81, 72, 73, 74, 78 (Hydraulic)

## K-12-1—GRINDING MACHINES—CYLINDRICAL—EXTERNAL

Include machines for external grinding other than centerless external grinding. Include cam grinders; also include Crank-pin, and Plain Grinders.

Cincinnati, 14", 16", 6", 10"

Norton 6"

Brown & Sharpe, Nos. 13-3", 14"

Grenby

Landis

Fitchburg

Van Norman

Arter

Bald

## K-12-2—GRINDING MACHINES—CYLINDRICAL—EXTERNAL—UNIVERSAL

Include grinding machines with a swiveling wheel head.

Norton

Landis

Cincinnati

Brown & Sharpe

## K-13—GRINDING MACHINES—CYLINDRICAL—INTERNAL

Include machines for internal grinding other than centerless internal grinding. Include also Chucking Grinders. Do not include planetary type or internal spherical seat type.

Heald Nos. 70A, 75A, 72A

Plain & Universal, No. 72 Sizematic

Bryant Nos. 3, 5A, 4B, 16-28", 16A-38"

Fitchburg

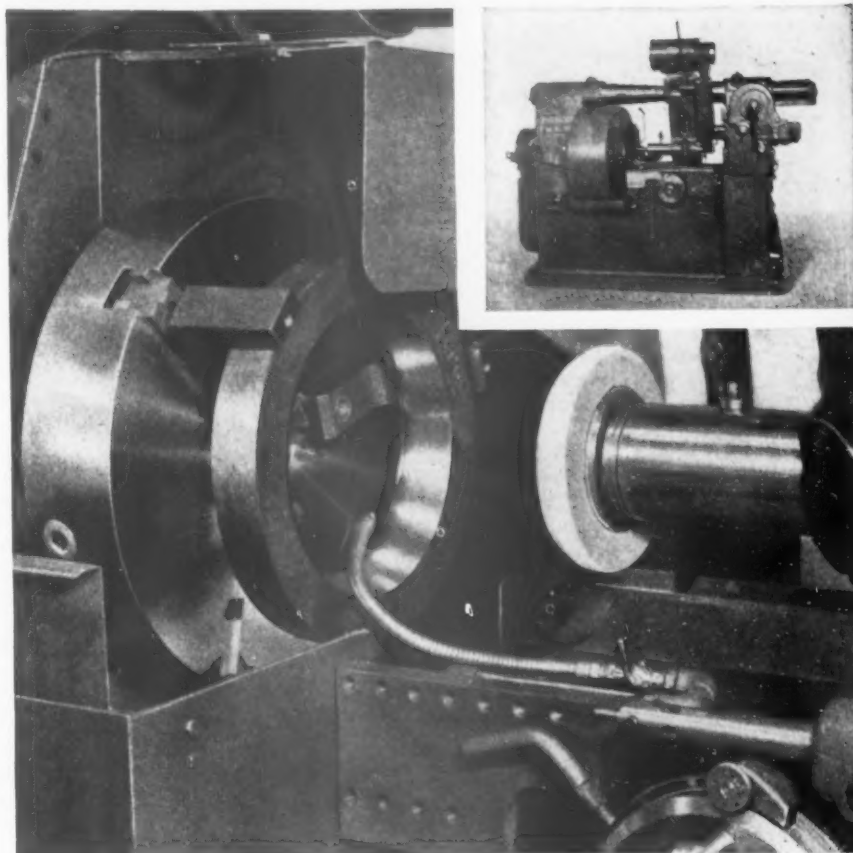
Wisco

Bald

Grenby

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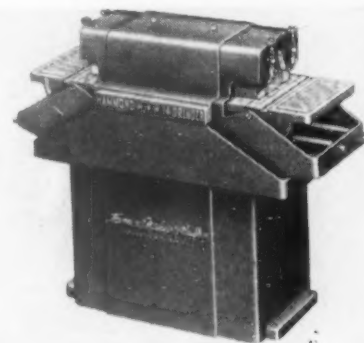
MARCH, 1942



Above. Bryant Chucking grinder showing how work is mounted in chuck and how wheel may be fed into work at any angle for internal grinding. The complete grinder is shown in insert at upper right corner.

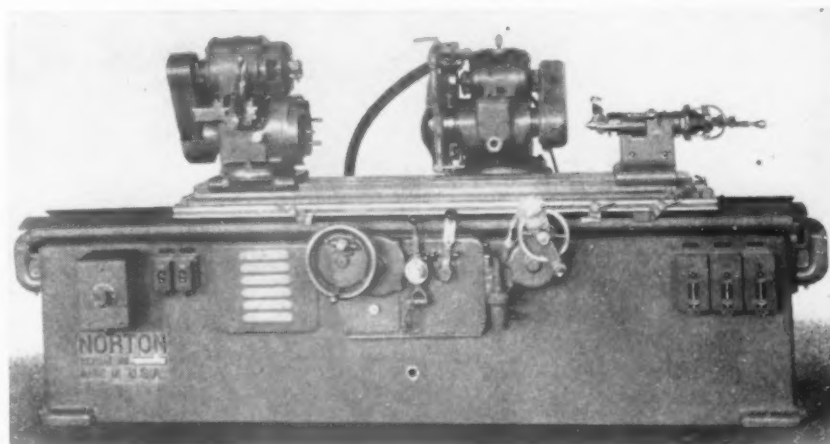


Carboloy grinder designed especially for sharpening carbide tipped tools.

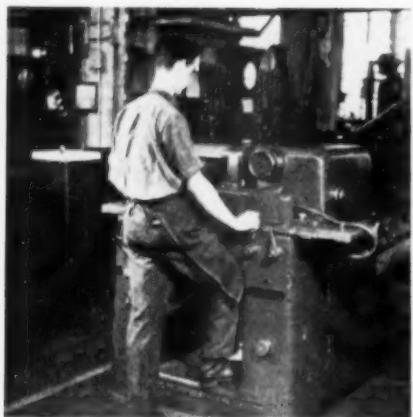


Hammond "No-splash" wet Grinders advantageous for sharpening carbide tools.

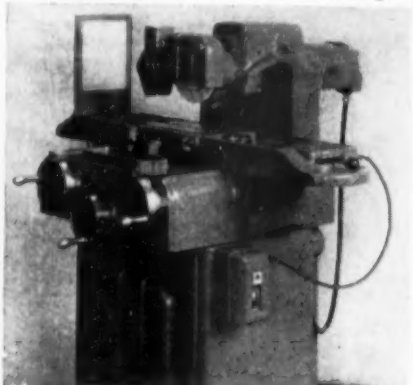
Below. Big Norton cylindrical grinder. A typical unit in this class.



# GRINDING MACHINES Surface and Thread



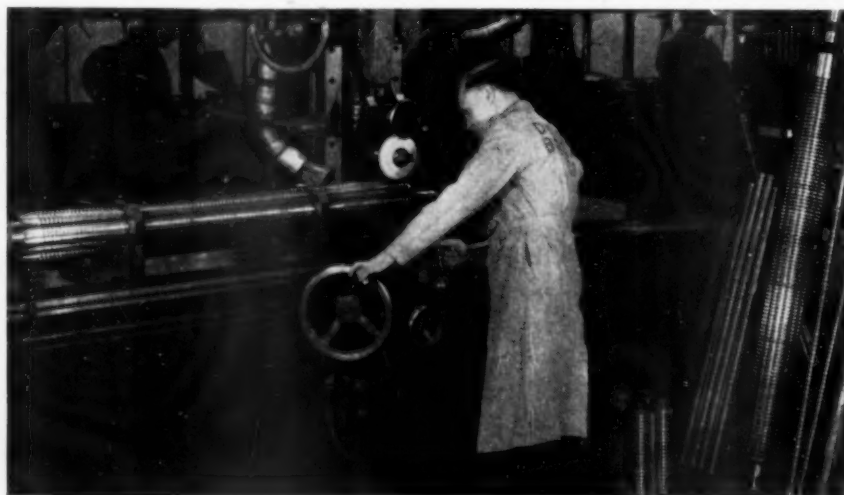
Landis No. 6 Precision Thread Grinding machine finishing threads up to 6" diameter and 12" long on work under 24" long.



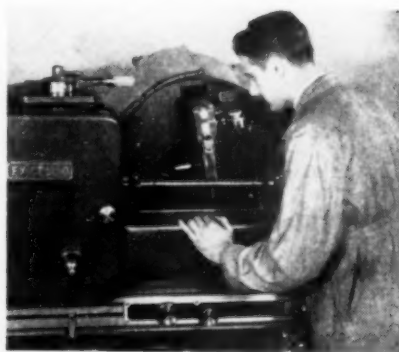
New Taft-Petree Precision Surface grinder which features a new type tilting spindle.



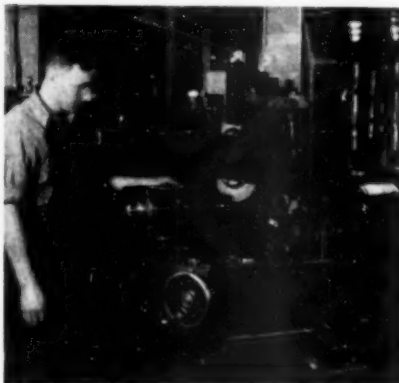
Boyer-Schultz Profile or Die Grinder has a vertically mounted grinding wheel.



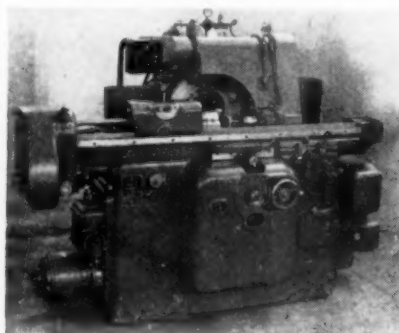
Typical example of broach grinding at Detroit Broach Co., plant. A Galmeyer and Livingston grinder is used.



Ex-Cell-O Style 35 Precision Thread Grinder shown finishing aircraft landing gear screw.



Dalzen Thread Grinder built for accuracy features wheel directly above work.



J & L Thread Grinding Machine which is entirely automatic in operation.



## K-14—GRINDING MACHINES—CYLINDRICAL—INTERNAL PLANETARY TYPE

Include machines used principally for grinding cylinder bores, where the work does not revolve, because of being awkwardly shaped.

Heald No. 55 (Knee type) (Gear Feed)  
Heald No. 72A Gagematic, Nos. 172 Gap, 174 Gap,  
72A Sigmatic Duplex, 73, 74, 81 Plain

Brown & Sharpe  
Heald No. 50 (Solid Base) (Hyd. Feed)  
Heald Nos. 81 Sigmatic, 81 Gagematic

## K-16—GRINDING MACHINES—INTERNAL—SPHERICAL SEAT

Include only machines for grinding internal spherical seats, e.g., ball races, Universal Joint ball housings, etc.

Van Norman, No. 42  
Landis

## K-17—GRINDING MACHINES—PROFILE GRINDER

Include machines, usually with a vertical spindle, the purpose of which is to grind profiles such as cam contours, irregular surfaces.

Boyer & Schultz, Nos. 1, 2  
Moore  
Baker No. 3  
Landis  
Norton "Cam-O-Matic"  
Koestlin "Grindrite"

## K-19—GRINDING MACHINES—SNAGGING GRINDERS

Include heavy-duty grinding machines designed for snagging of castings, forgings, etc., usually 7½ H.P. and over. Include both pedestal and swing.

United States, Nos. 30, 40, 65, 67  
Hammond No. WH  
Hiley-Wolf, No. 10TW  
Marschke  
Ransom  
Blount  
Bridgeport  
Vonnegut Moulder

## K-19-1—GRINDING MACHINE—SWING

Include machines consisting of a base and swinging arm supporting a grind wheel and which is used for snagging large castings.

Norton Grinder

## K-20—GRINDING MACHINE—SURFACE GRINDER—RECIPROCATING—KNIFE AND SHEAR BLADE—FACE GRINDING

Include machines for surface grinding where grinding is done on the face of the wheel and where the work or the wheel reciprocates. Do not include machines designed to grind on the periphery of the wheel or disc grinders.

Covel-Hanchett, "Hanchett 500"  
Abrasive  
Norton 6 x 18"  
Hill  
Hanchett

## K-21—GRINDING MACHINES—SURFACE GRINDERS—RECIPROCATING—PERIPHERY

Include machines for surface grinding where grinding is done on the periphery of the wheel and where the work reciprocates. Do not include machines designed to grind on the face of the wheel. A surface grinder is a precision machine.

Reid, No. 3  
Bridgeport, 32"  
Brown & Sharpe Nos. 2, 2B, 5  
Covel-Hanchett, No. 78  
Abrasive  
Gallmeyer & Livingston  
Norton 6 x 18", 10" Hyd., 12" Hyd.  
Grand Rapids  
Hill  
Taft-Petree  
Thompson

## K-22—GRINDING MACHINES—SURFACE GRINDERS—ROTARY

Include machines for surface grinding where the work revolves beneath the grinding wheel.

Gardner No. 141A  
Blanchard Nos. 10, 11, 16, 18, 16A, 16A2, 27  
Hanchett  
Heald  
Walker  
Exello

## K-23—GRINDING MACHINES—THREAD GRINDERS

Include only machines designed for grinding (generating) internal or external threads.

Jones & Lamson  
Dalzen

## K-24-1—GRINDING MACHINES—CUTTER GRINDER—PLAIN AND UNIVERSAL

Include machines designed especially for grinding various kinds of cutters other than the special types listed below.

Cincinnati, Nos. 1½, 2  
Le Blond, No. 2  
Ingersoll, 30"  
Norton, Nos. 1, 2  
Brown & Sharpe Nos. 10, 13  
Gleason  
Fellows  
Keller, No. 6  
Ohio  
"Grand Rapids"



# HONING and LAPPING MACHINES



## K-24-2—GRINDING MACHINES—CUTTER GRINDER—BANDSAW

Include machines designed for sharpening bandsaws.  
American

## K-24-3—GRINDING MACHINES—CUTTER GRINDER—BROACH

Include machines designed for sharpening broaches.  
LaPointe  
Colonial  
Thompson  
National Broach, "Red Ring"  
Pariser-Colman

## K-24-4—GRINDING MACHINES—CUTTER GRINDER—CHASER

Include machines for sharpening chasers.  
Jones & Lamson  
Modern Tool  
H & G  
National Acme Co.  
Nanco Nos 9, 15, 18

## K-24-5—GRINDING MACHINES—CUTTER GRINDER—DRILLS

Include machines for sharpening and pointing drills.  
Union Twist Drill, No. 3  
Oliver, No. 21  
Grand Rapids, No. C-5-T  
Yankee  
Sellers, No. 05D  
Delta  
Black Diamond, Nos. 1, 2  
"Grand Rapids" Nos. A5T, BTT

## K-24-6—GRINDING MACHINES—CUTTER GRINDER—HOB SHARPENERS

Include machines designed for sharpening hobs.  
Harber-Colman No. 3  
Union Twist Drill

## K-24-7—GRINDING MACHINES—CUTTER GRINDER—REAMER

Include machines designed for sharpening reamers.  
Combination of cutter and reamer grinders are to be classified as Cutter Grinder—Plain and Universal.  
Brown & Sharpe No. 10  
Hoeh  
Grenby

## K-24-8—GRINDING MACHINES—CUTTER GRINDER—TAP SHARPENERS

Include machines designed for sharpening taps.  
D & S, Type B  
Grand Rapids, No. 12  
Corel-Hanchett  
Boggs  
Detroit Tap  
"Grand Rapids", Nos. 1M, 2M, 12M

## K-24-9—GRINDING MACHINES—CUTTER GRINDER—TOOL BIT—(LATHE AND PLANNER TOOLS)

Include machines designed for sharpening lathe and planer tools.  
Sellers  
Oliver  
Ransom, Nos. 108, 109, 124, 131, 141, 142  
Gisholt  
Excello, Nos. 46, 48 (Carbide)

## L-5—HONING MACHINES—CYLINDRICAL

Include machines used for honing bores, holes, etc., using stones in suitable holding fixtures and operating with a combined rotating and reciprocating motion.

See MILLING MACHINE—PROFILE—O-13

Micromatic  
Barnes, Nos. 194, 224, 306-H, 249, 2420, 214  
W. F. & John Barnes  
Norton  
Hutto  
Moline, No. 11  
Barnes—Horizontal—Nos. 1, 2, 6, 12, 20, 30  
Simmons "Cinn"

## M-5—LAPPING MACHINES—FLAT

Include machines designed to lap flat surfaces or where lapping is done between parallel plates.

Norton, No. 10-U  
Bethel-Player  
Nos. 2, 26, "Hyprolap"  
Gardner

...LAPPING MACHINES—GEAR ...  
See GEAR MACHINES—FINISHING—LAPPING—J-13.

## M-6—LAPPING MACHINES—CYLINDRICAL

Include machines for lapping work revolving on centers. Do not include lapping of cylindrical parts done between parallel surfaces.

Norton, Nos. 30 "Cam-O-lap", 30 "Crank-O-lap", 40 "Crank-O-lap"  
Excello  
Barnes

## M-7—LAPPING MACHINES—CENTERLESS

Include machines designed to lap cylindrical parts without centers. Do not include machines which lap between two parallel surfaces or between centers.



MARCH, 1942

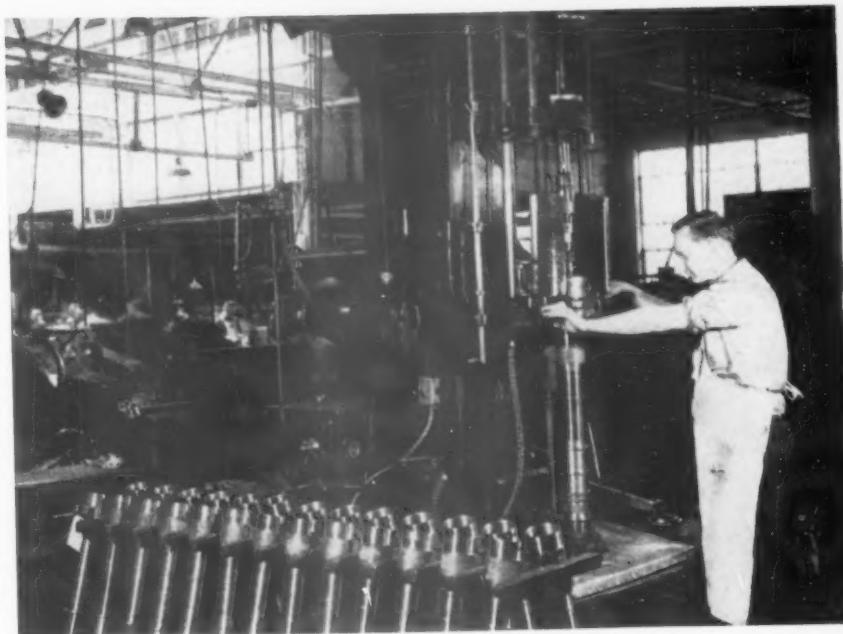
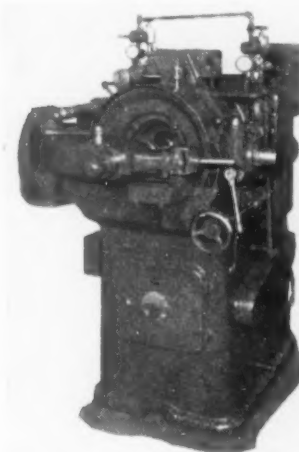


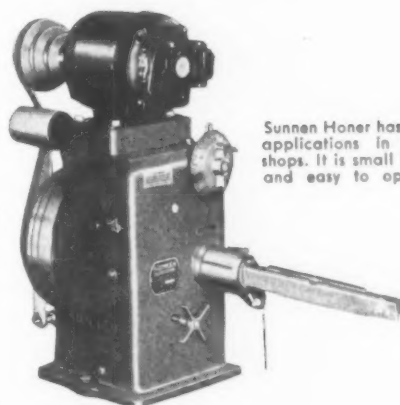
Photo Courtesy Curtiss-Wright Corp.  
Barnes Honing machine finishing airplane landing gear oleo-cylinders.



Superfinish is now possible on many production parts. Ohio Units machine shown at left.



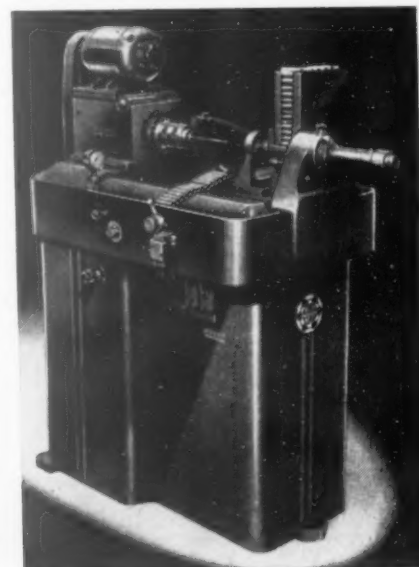
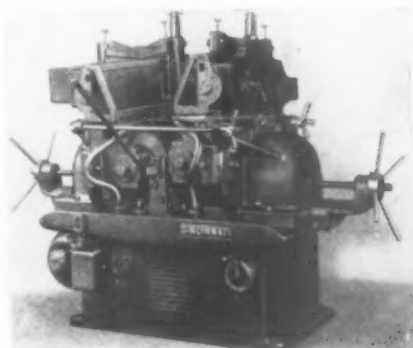
Above. Special Fellows gear lapper, finishes hardened gears that cannot be ground.



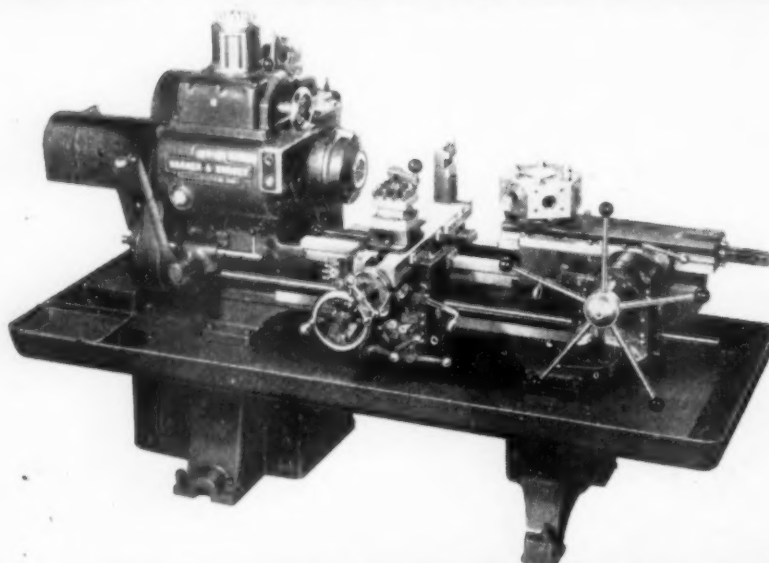
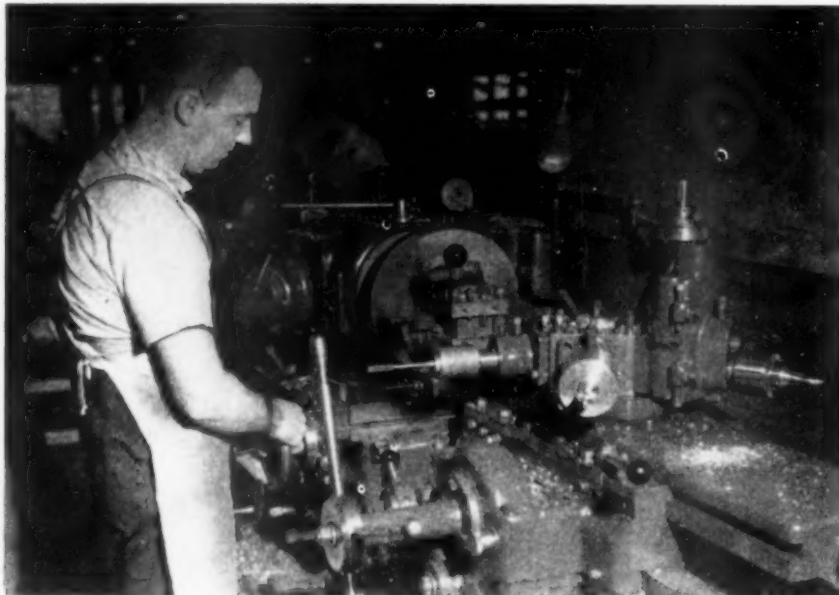
Sunnen Honer has many applications in many shops. It is small in size and easy to operate.

Below. Latest design of Micromatic Hydro-Honer provides unusually fine production finishes.

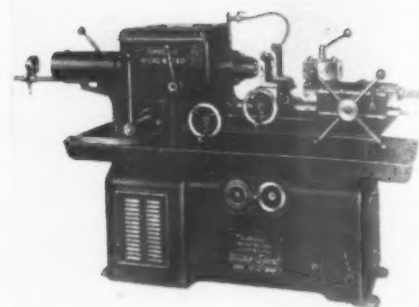
Below. Centerless grinding principle as applied to lapping machines by Cincinnati grinders.



# LATHES - Turret - Vertical



Top. OEM photo by Palmer. Jones & Lamson Turret lathe in the Navy. Center. Warner & Swasey heavy duty, high production type Turret lathe. Bottom. Bullard Vertical Turret lathes are built for big jobs and are as useful in shipyards and naval bases as in the manufacturing shop.



Simmons "Micro-Speed" turret lathe features 1000 speed changes instantly with spindle running in either direction.

## ★ ★ ★ ★ ★ ★ ★ ★

### N-1—LATHES—TURRET—HORIZONTAL

Include general-purpose lathes equipped with headstock and turret in lieu of tailstock—hand-operated, used in repetitive work. See also Chucking Machines Classification D-5.

- Bardons & Oliver
- Gisholt
- Jones & Lamson Nos. 3, 4, 5, 7B, 8B, 7C, 8C
- Warner & Swasey, Universal Nos. 3, 4, 5, 1-A, 2-A, 3-A, 4-A
- Millholland
- Morrey
- Southwark
- Acme, 5R, 6R, 5W, 6W, Nos. 1, 2, 15, 25
- Brown & Sharpe, Nos. 9, 1, 2
- LeBlond 14" swing, 30"
- 16" swing, 30"
- 18" swing, 30"
- 20" swing, 44"
- 25" swing, 50"
- 32" swing, 64"

### N-2—LATHES—TURRET—VERTICAL

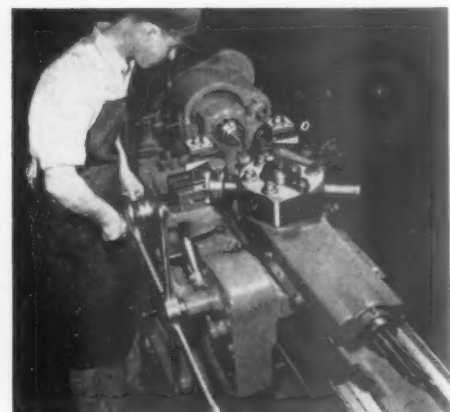
Include general-purpose lathes which have axis of rotation of work in vertical plane and turrets in lieu of tailstocks—generally used in connection with repetitive work. See also CHUCKING MACHINES—CLASSIFICATION D-5.

- Bullard
- Sellers
- Baird

### N-3—LATHES—AUTOMATIC

Include general-purpose lathes which have headstock and a tailstock and tool slides used in repetitive work

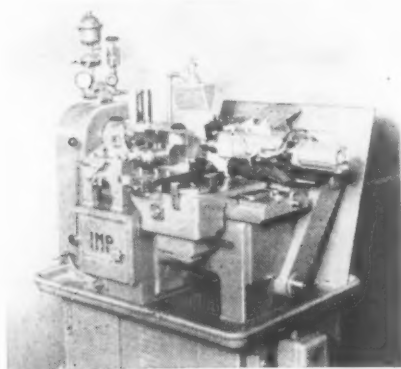
## ★ ★ ★ ★ ★ ★ ★ ★



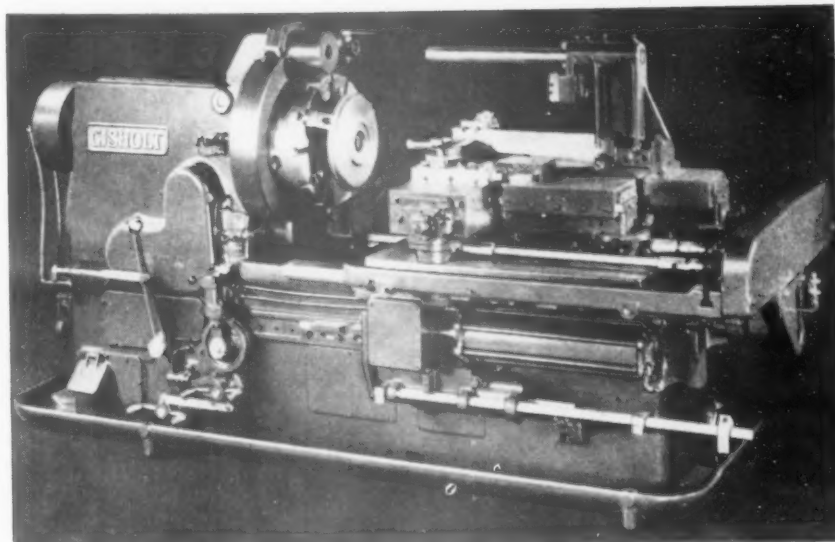
South Bend Turret lathes are only one of 65 sizes and styles which they build.

THE TOOL ENGINEER

# Horizontal and Automatic



Automatic rough turning done with "Lo-Swing" lathe. Operator only loads and unloads it.



Above. Gisholt Simplimatic Automatic lathe provides two or more tools with independent feeds and drives.

Below. Newest Seneca Falls "Lo-Swing" multiple tool automatic lathe — valuable for war work.

★ ★ ★ ★ ★ ★ ★ ★

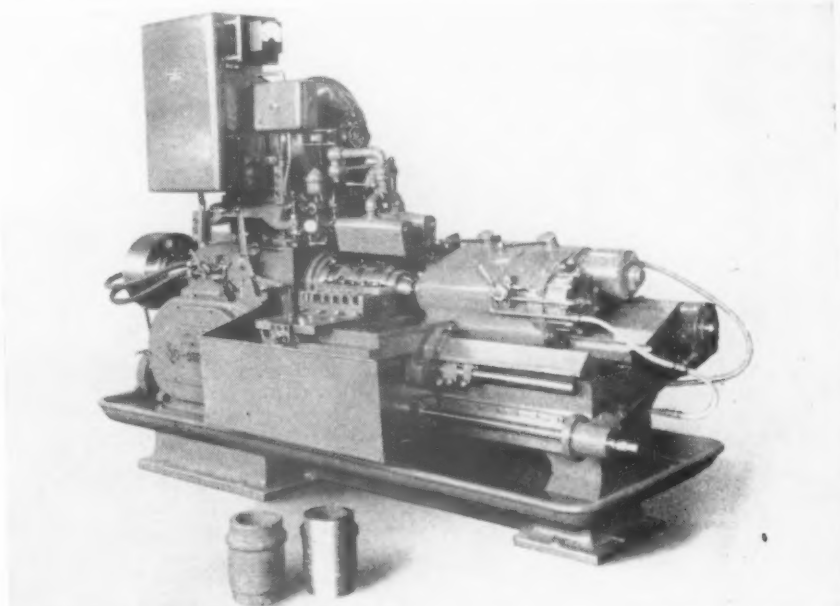
and perform a series or cycle of operations automatically after the machine is loaded. These lathes are frequently referred to as Production Lathes.  
Seneca-Falls, "Short Cut"  
Seneca-Falls, "Lo-Swing"  
Seneca-Falls, "Lo-Swing Imp."  
Jones & Lamson, "Fay"  
LeBlond, "Multicut"  
Lipe, "Carbo-matic"  
Barnes No. 12  
Lodge & Shipley, "Duomatic" Nos. 1, 3, 5  
Monarch  
Morey  
Porter-Cable  
Pratt & Whitney  
Sundstrand, "Stub" Nos. 8, 10, 12  
Baird

## N-4—LATHES—SPECIAL

Include lathes which are designed for a special purpose as distinguished from lathes designed for general purpose, such as double-end drive and center drive, piston, brake drum, crankshaft, etc. Every reasonable effort should be made to place each machine in one of the "Standard" classes. If a machine is essentially a "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" class and indicate the special attachment by the abbreviation "S.A."

LeBlond, "Crankshaft", 26", 36", Nos. 7-AC1, DM  
Crankshaft Machine Co., "Melling Crankshaft"  
Niles, "Wheel lathe"  
Sundstrand, "Brakedrum"  
Baird  
Morey  
Wickes, "Crankshaft"  
Hinkley-Meyers, "Brake Drum"

★ ★ ★ ★ ★ ★ ★ ★



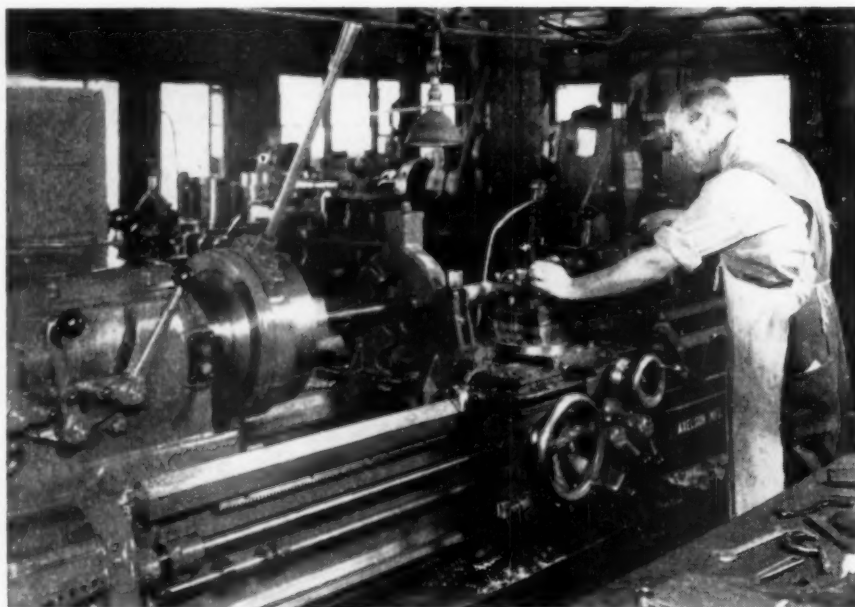
Below. Foster turret lathe on a production job in an aircraft factory. Photo courtesy Wright Aeronautical Corp.



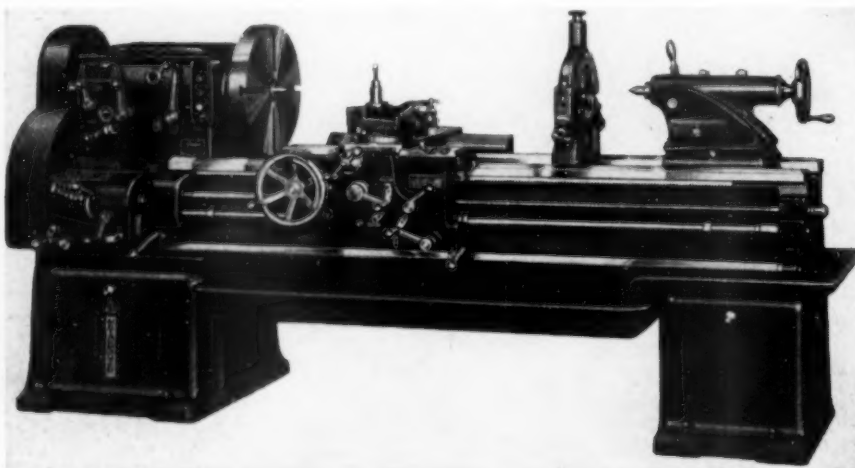
Oster simple turret Lathe ideal for rapid training of new operators.



# LATHES - Special - Speed - Bench



Axelson heavy duty lathe at Mac Clatchie Mfg. Co., turning 189 foot oil well piston rod—one end of which is tapered.



Above. Bradford Metalmaster Geared Head Lathe features twelve speeds.

Below. Hardinge High Speed Lathes exemplify the precision type.



Atlas tool room lathes with small carriage turret used in production at Inland Mfg. Co. in Buffalo, New York.

★ ★ ★ ★ ★ ★ ★ ★

## N-5—LATHES—SPEED

Include general-purpose small lathes, without feed mechanism used for light burring, polishing and reaming operations.

Cincinnati 10"

Oliver

Blount

Wells

## N-7—LATHES—BENCH

Include general-purpose engine lathes of a relatively small size designed to operate on a bench or table instead of on its own pedestal. Headstock and tailstock, hand-operated, with or without power feed but with tool slides.

Ames

Hardinge, "Cataract"

Elgin

Hjorth, "Precision"

South Bend

Rivett

Sheldon

Cincinnati 10" and 13"

## N-6—LATHES—ENGINE

Include general-purpose lathes equipped with headstock and tailstock—hand-operated. Include Gap Lathes also. Double end drive and center drive lathes are considered as "Lathes—Special", N-4.

Seneca-Falls, "Star"

Boye & Emmes

Bradford

Carroll & Jamieson

Champion

Charl

Diao

Davis

Fairbanks

Graves & Klausman

Hendey

LeBlond 12", 14", 16", 18", 30" center;

20", 25", 48" center;

32", 40", 50", 60" center

Lehman

Lodge & Shipley, 14" to 36"

Monarch

Mulliner

Praet & Whitney

South Bend

New Haven

American

Reed Prentice

Rockford

Sebastian

Sheldon

Sidney

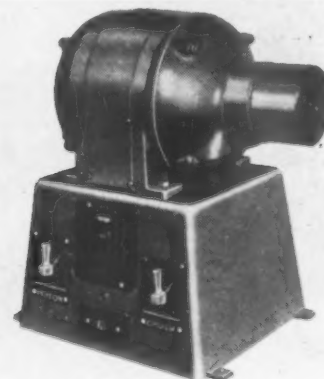
Springfield

Stark

Wolcott

Porter-McLeod

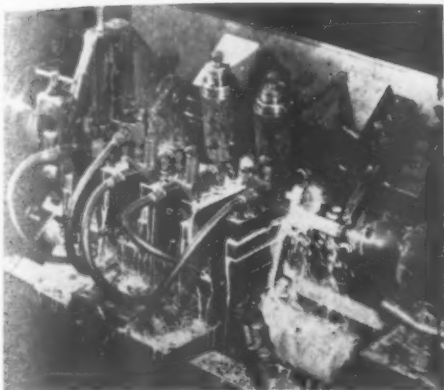
★ ★ ★ ★ ★ ★ ★ ★



Lima Magnetic Polishing Lathe used for special production finishing work.

THE TOOL ENGINEER

# Engine Profile LATHES



Fay Automatic lathe turning long cylindrical piece probably a gun barrel. The work is held between centers and cutting is done by multiple tools.

★ ★ ★ ★ ★ ★ ★ ★

## N-9—LATHES—PROFILE

Include lathes which are equipped with profiling attachment, i.e., an attachment which controls the tool slide automatically so as to permit a shape to be reproduced, with or without tailstock. Automatic cycling after loading.

Monarch  
Reed Prentice

## N-10—LATHES—WOOD TURNING

Include all wood turning lathes. It is thought the quantity of such lathes does not require further breakdown.

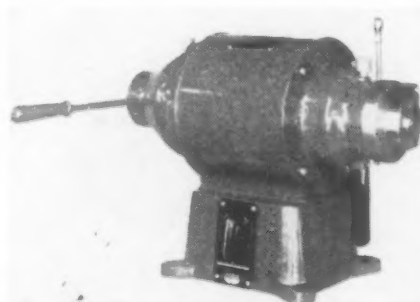
Imperial  
Klausman  
Blount  
Oliver

## N-11—LATHES—SPINNING

Include machines having single tailstock and use where close tolerances are not required.

Bliss

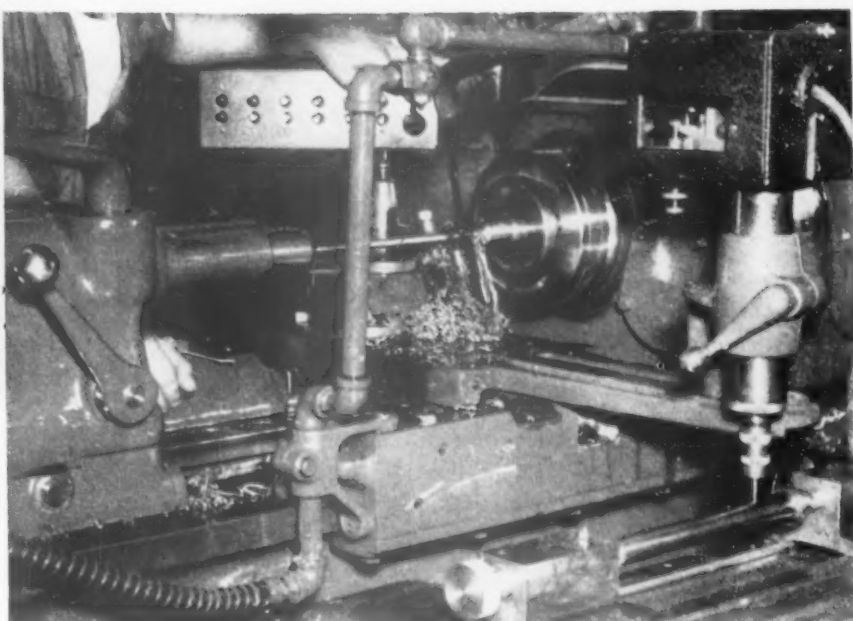
★ ★ ★ ★ ★ ★ ★ ★



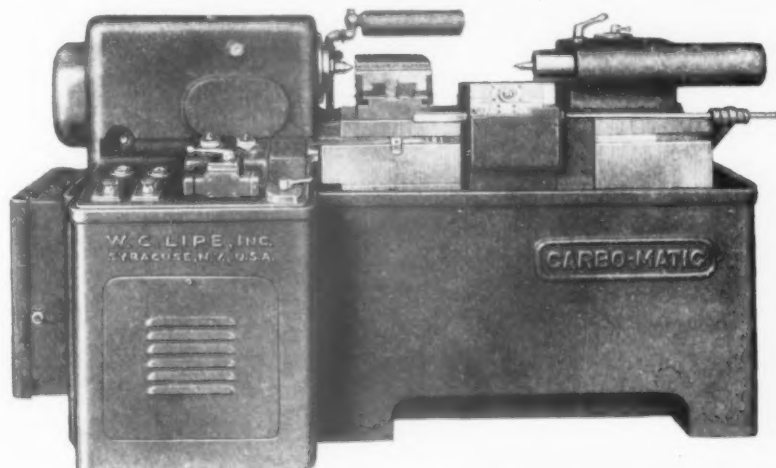
Schauer Speed lathe with hand operated chuck.



Nylen, the new 6 inch vertical automatic chucking lathe with multiple cutting tools.



Heavy duty Monarch Lathe equipped with a Keller attachment for profiling long taper pins used in aircraft landing gears. Photo courtesy Wright Aeronautical Corp.

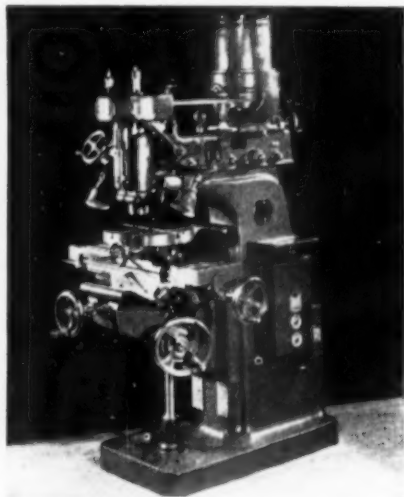


Carbo-Matic lathe made by W. C. Lipe, Inc. This type of super-fast, super-rigid lathe is for use with carbide and diamond tipped tools.

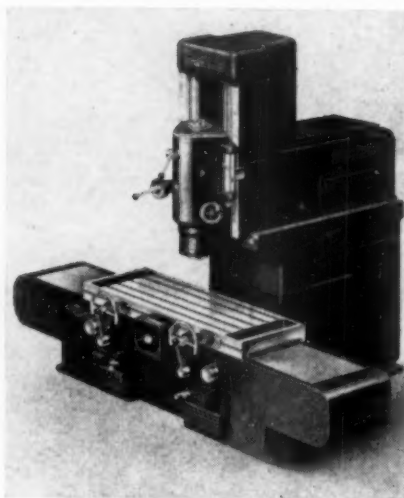
South Bend tool room precision lathe complete with accessories.



# MILLING MACHINES---- vertical



Example of Vertical universal milling machine. This Gorton miller used for die and jig making as well as production.



One of the newest types of vertical milling machines is exemplified in this Reed-Prentice.



Special Moline Milling Machine used to finish a spherical radius hole at an angle.

★ ★ ★ ★ ★ ★ ★ ★

## 0-2—MILLING MACHINES—VERTICAL

Include milling machines with vertical spindle, power feed.

Cincinnati, 1M  
Cincinnati Nos. 1, 2-M, 2; 2, 3, 4, Dial Type  
Brown & Sharpe No. 2  
Bridgeport  
Taylor & Fenn  
Reed Prentice  
Van Norman  
Kempsmith  
Kearney-Trecker, "Milwaukee" 1H12, 1H8, 1H, 2H6,  
2H, 2KM, 2K, 3H, 3KM, 3K, 4K, 4H, 5H  
Becker  
Production Eng. Co.  
Knight Nos. 1½, 20, 30, 40  
Gorton Nos. 8D, 8½D, 9J

## 0-3—MILLING MACHINES—AUTOMATIC

Include only milling machines equipped with automatic indexing, feed, return; such as would be used for milling squares, hexagons, octagons, etc.

Producto 2½  
Brown & Sharpe  
Kearney-Trecker  
Morris  
Production Eng. Co.

## 0-4—MILLING MACHINES—SPECIAL

Include milling machines other than classified above, i.e., milling machines designed to perform a special function. Include in this "Special" class those machines which are designed for a special purpose and which cannot be readily adapted to another job. Every reasonable effort should be made to place each machine in one of the "Standard" classes. If a machine is essentially a "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" class and indicate the special attachment by the abbreviation "S.A."

Production Eng. Co.  
Morris

Consolidated  
Davis & Thompson

## 0-5—MILLING MACHINES—BENCH

Include only small, bench milling machines, either hand or power feed.

Stark  
Burke, Nos. 0, 1, 3  
Ames  
Hardinge, "Catacraft" MD-4  
Pratt & Whitney

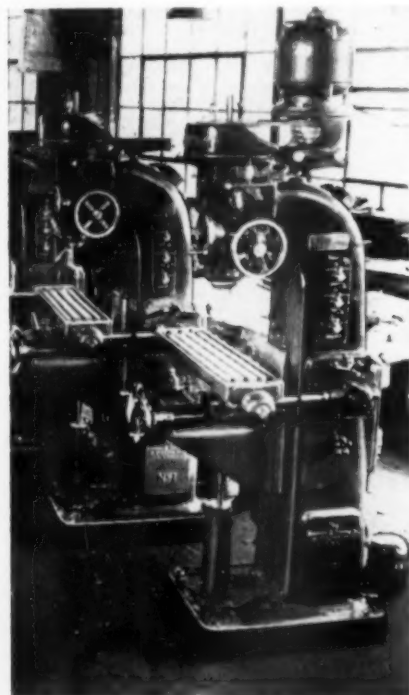
★ ★ ★ ★ ★ ★ ★ ★

Latest Van Norman Horizontal Bed-Type Miller.

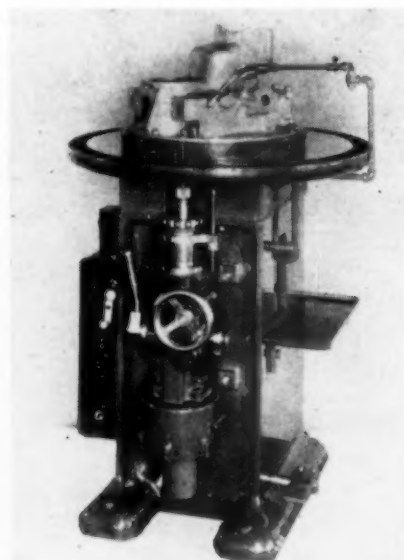


Brown & Sharpe Milling Machines are a standard of quality for fine tools.

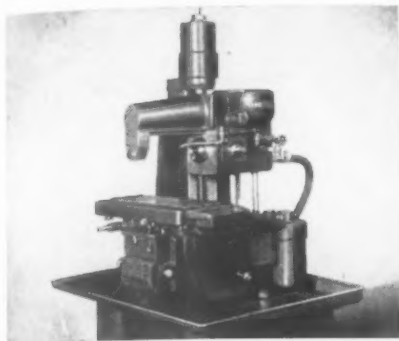
Cincinnati Duplex Miller designed to give maximum production where two parallel surfaces can be finished simultaneously.



Back "spot facing" machine made by Taft-Peirce. A specially designed tool for a tricky job.



# Horizontal - Automatic - Special



Cincinnati Milling Machine with hydraulic control for raising and lowering head.



## 0-6—MILLING MACHINES—DUPLEX

Include milling machines having two opposed, independently driven, horizontal spindles, in which the work feeds horizontally on a table.

Milwaukee, Kearney & Trecker, Nos. 1224, 1236, 1248, 1836, 1848, 1854  
Cincinnati "Hydromatic"  
Cincinnati, 24", 48", 12"  
Production Eng. Co.  
Sundstrand-Hydro-Screw

## 0-7—MILLING MACHINES—DRUM

Include milling machines having horizontal spindles in which the work rotates with the drum and is continuous and in which two sides of a part are milled simultaneously, e.g., cylinder blocks.

Ingersoll  
Consolidated Machine Tool Corp., "Newton"  
Davis & Thompson

## 0-8—MILLING MACHINES—HAND

Include only small milling machines, in which the feeding movements of the table are hand controlled and sensitive and not on bench.

Brown & Sharpe No. 00  
Kent-Owens, Nos. 1, 2  
Burke  
Vernon  
U. S. National, No. 1  
Whitney, No. 6  
Kemp Smith  
Sundstrand, Nos. 3, 6, 60

## 0-9—MILLING MACHINES—PLAIN—FIXED BED

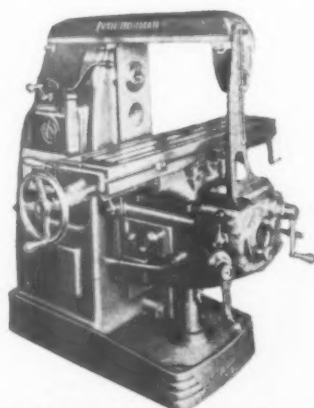
Include milling machines with horizontal spindle, power feed, fixed or box-bed, and the tables of which do not swivel. May be either mechanical or hydraulic feed. Also called "Manufacturing-type" miller.

Brown & Sharpe, Nos. 000, 12  
Cincinnati "Hydromatic" No. 4-36  
Sundstrand, "Rigidmill" 3-W-2, No. 30  
Kemp Smith, No. 33  
Kearney & Trecker, "Milwaukee" Nos. 1224, 1236, 1248, 1824, 1836, 1854, M18, M24, M30  
Kent-Owens  
LeBlond  
Cincinnati Nos. 2-18, 2-24

## 0-10—MILLING MACHINES—PLAIN—KNEE TYPE

Include milling machines with horizontal spindle, power feed, column-and-knee-type mounting, and the tables of which do not swivel.

LeBlond, No. 1B  
Cincinnati, Nos. 4, 2, 3, Dial type  
Kemp Smith, No. 2  
Brown & Sharpe, No. 2, 3  
Kearney & Trecker, "Milwaukee" Nos. 1H12, 1H Plain, 3KM, 2KM Plain, 5H  
Cincinnati Nos. 4, 5 HI-Power



Van Norman Horizontal type miller with knee type vertically adjustable table.

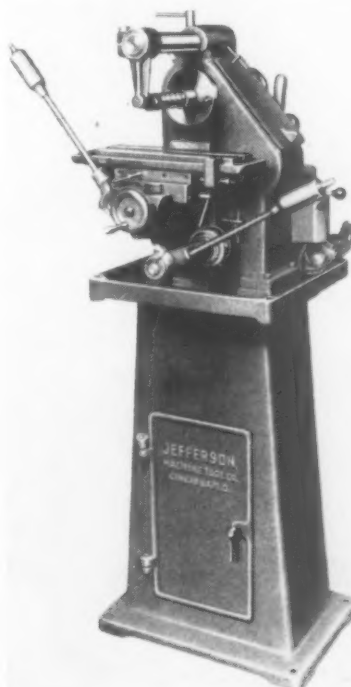


Above. Battery of fully automatic U. S. Milling machines, used for producing small precision parts at John Wood Mfg. Co., Detroit. These machines have a 2" vertical spindle head movement and a 5" table feed. Spindle movement is synchronized with table movement.

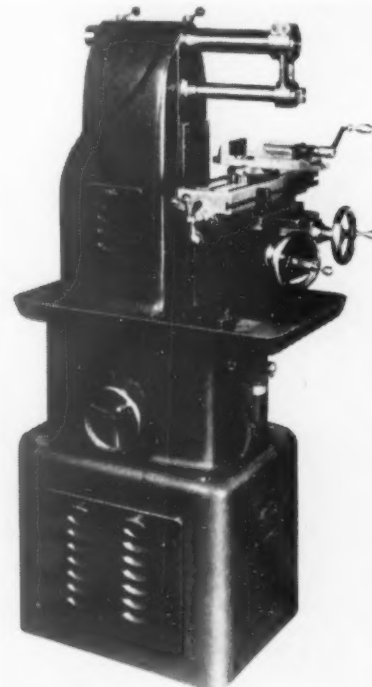


New radius contour or profile milling machine designed by Snyder Tool and Engineering Co., for milling bosses on connecting rod caps. The machine is fully automatic, once loaded — mills three units at a time and finishes both bosses on each cap.

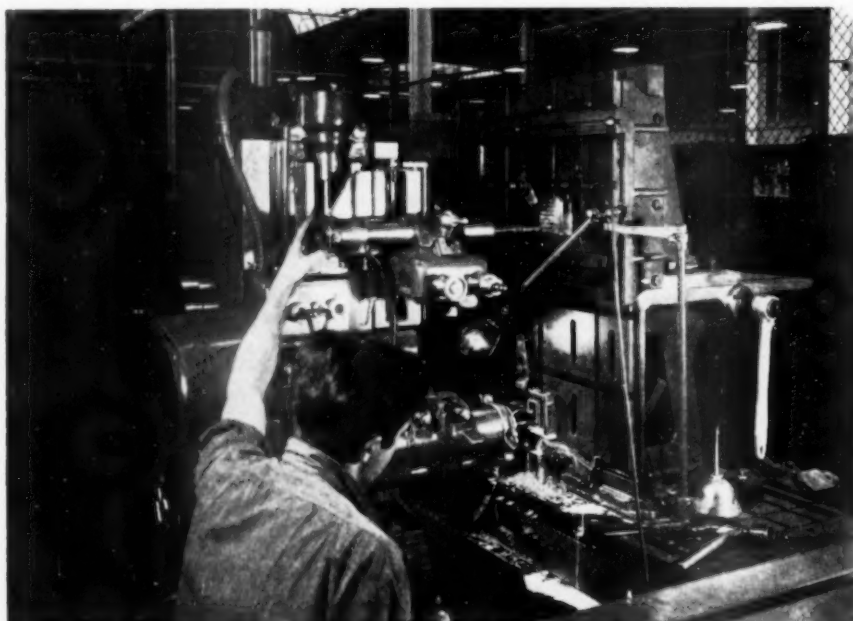
Below. Jefferson Machine Tool Co., features a quick action hand milling machine. It may also be obtained with power feed.



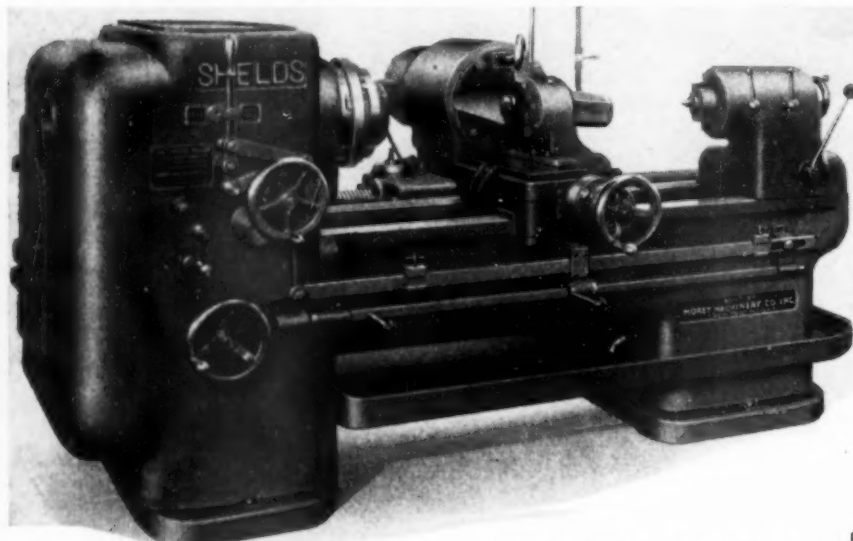
Below. Vernon Horizontal Miller has carefully sealed Timken taper roller spindle bearings. It is provided with a vari-drive.



# MILLING MACHINES Profiling



Keller Profiling or Die Sinking machine in action showing how the form of pattern above is transferred to a milling cutter which shapes the work below.



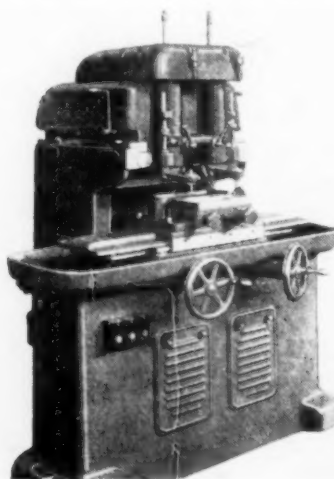
Shields makes a heavy duty 12 inch thread milling machine which is illustrated above.

Cincinnati Hydro-Tel profiling type milling machine. Hydraulic controls in all three directions.



Right—Small Universal head type milling machine made by Midway useful for wide variety of work.

National Broach Co., Profiler that has many applications where small parts have to be duplicated from a master pattern.



★ ★ ★ ★ ★ ★ ★ ★

## 0-11—MILLING MACHINES—PLANNER TYPE

Include milling machines, having a traveling table, similar to a planer table, which provides the feed, the cutting being done by one or more milling cutters.

Sellers  
Consolidated Machine Tool Corp.—"Newton"  
Ingersoll  
Cincinnati  
Davis & Thompson  
Gray  
Production Eng. Co.

## 0-12—MILLING MACHINES—PLANETARY

Include milling machines, with a horizontal spindle, the spindle of which has eccentric sleeves which permit internal and external circular milling.

Hall  
Cincinnati "Eccentric"  
Plan-O-Mill

## 0-13—MILLING MACHINES—PROFILE

Include milling machines which are designed inherently for profiling, i.e., where the movements of the cutter and the work are automatically controlled by means of a follower finger.

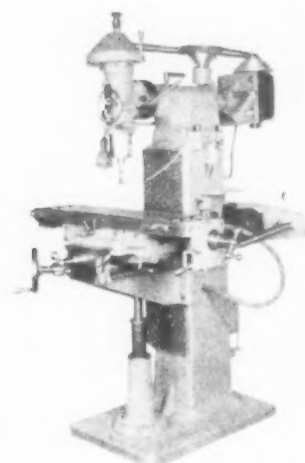
Cincinnati, "Hydrotel" & "Hydro-Diematic"  
Pratt & Whitney, "Keller Automatic", No. BL-2416  
Morey, 12M

## 0-14—MILLING MACHINES—ROTARY

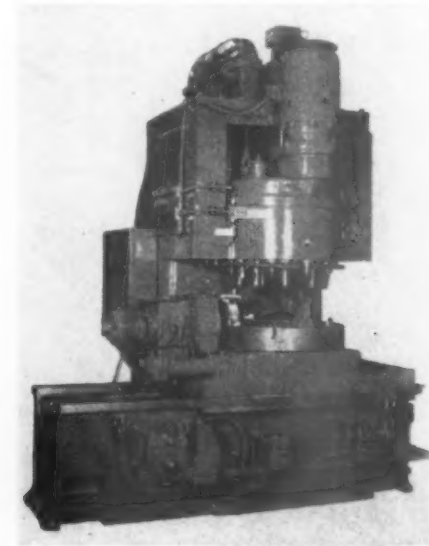
Include milling machines with vertical spindles, with a rotary table and in which the cutting is continuous. Do not confuse with drum-type millers.

Newton, 066A  
Ingersoll  
Oesterlein, "Ohio"  
Sundstrand  
Consolidated 066A

★ ★ ★ ★ ★ ★ ★ ★



Heavy duty Davis & Thompson vertical miller with multiple spindles and a turntable. Provided with complete electrical control.



THE TOOL ENGINEER

# Thread Milling HOBGING

★ ★ ★ ★ ★ ★ ★ ★

## 0-15—MILLING MACHINES—SPLINE

Include only milling machines designed to mill two opposite grooves simultaneously with opposed spindles and reciprocating table. These machines are not to be confused with duplex milling machines because they are much lighter and are designed especially for milling splines, elongated slots, keyways, etc. Do not include hobbing machines where splines are generated with a hob.

Taylor & Fenn  
Pratt & Whitney

## 0-16—MILLING MACHINES—THREAD

Include milling machines designed to mill threads and worms with hobs or milling cutters, internal or external.

Fellows  
Hanson-Whitney  
Lee-Bradner  
Taft-Peirce  
Hall Planetary  
Pratt & Whitney  
Waltham  
Morey

## 0-17—MILLING MACHINES—UNIVERSAL

Include milling machines with horizontal spindle, power feed, and the tables of which swivel.

Brown & Sharpe, Nos. 2, 3  
Kearney-Trecker, "Milwaukee" Nos. 1H, 2HL, 2KM, 4H, 4K, 5H

Van Norman  
Cincinnati, Nos. 2, 3

## 0-18—MILLING MACHINES—SWIVEL HEAD

Include milling machines having cutter spindle adjustable in any direction in relation to the table.

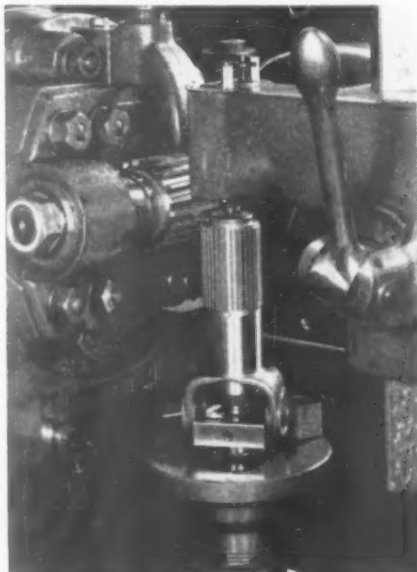
Bridgeport  
Van Norman

★ ★ ★ ★ ★ ★ ★ ★

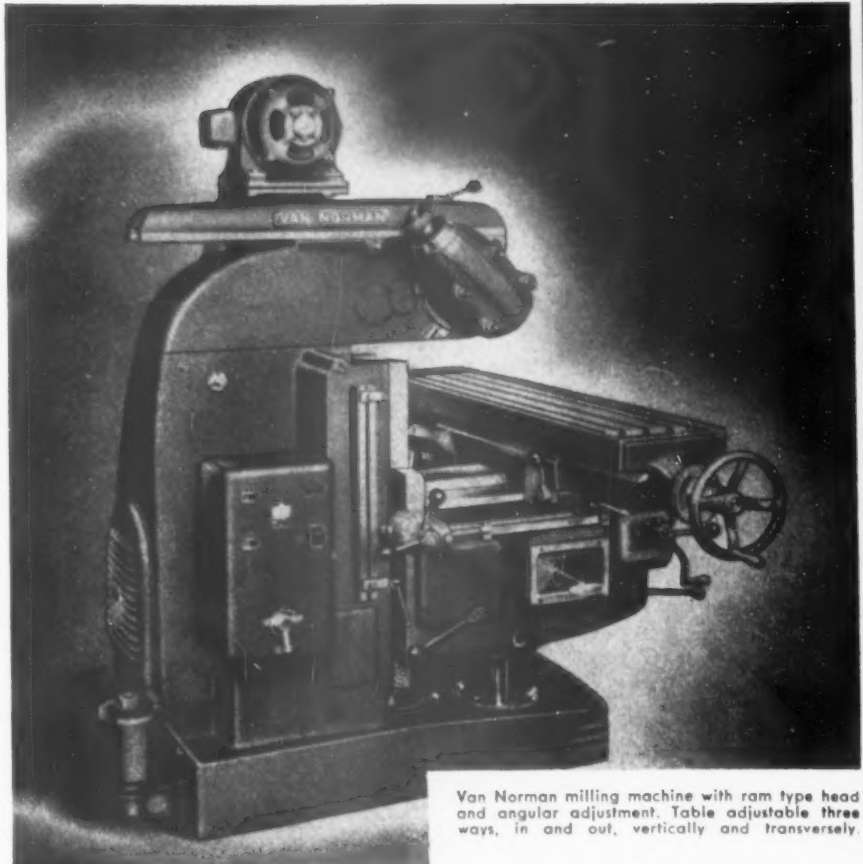


Above. Lees-Bradner Automatic Thread Mill for cutting both internal and external threads.

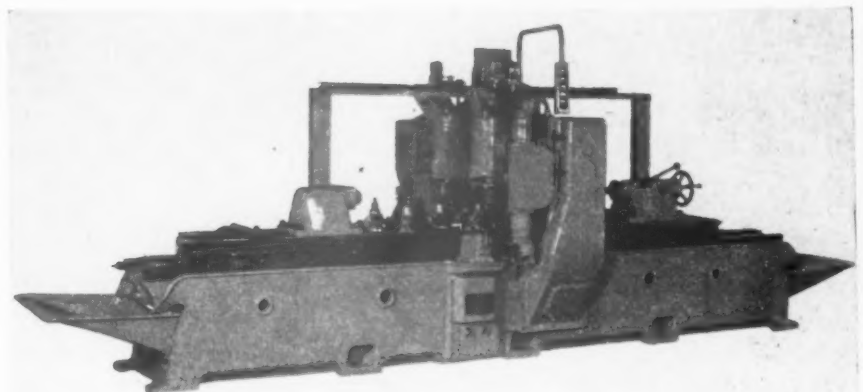
Cleveland Hobbing Machine cutting splines.



MARCH, 1942



Van Norman milling machine with ram type head and angular adjustment. Table adjustable three ways, in and out, vertically and transversely.

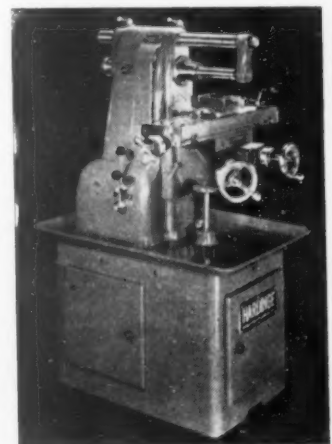


Above. Sundstrand Airplane Propeller Edge Mill designed to finish both sides of the blade simultaneously.

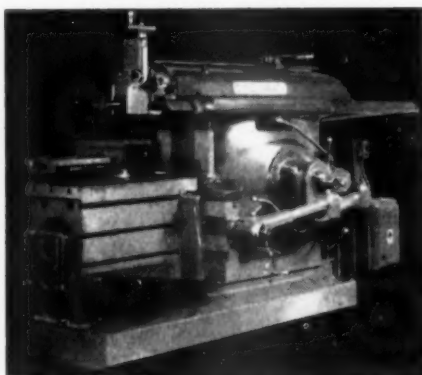
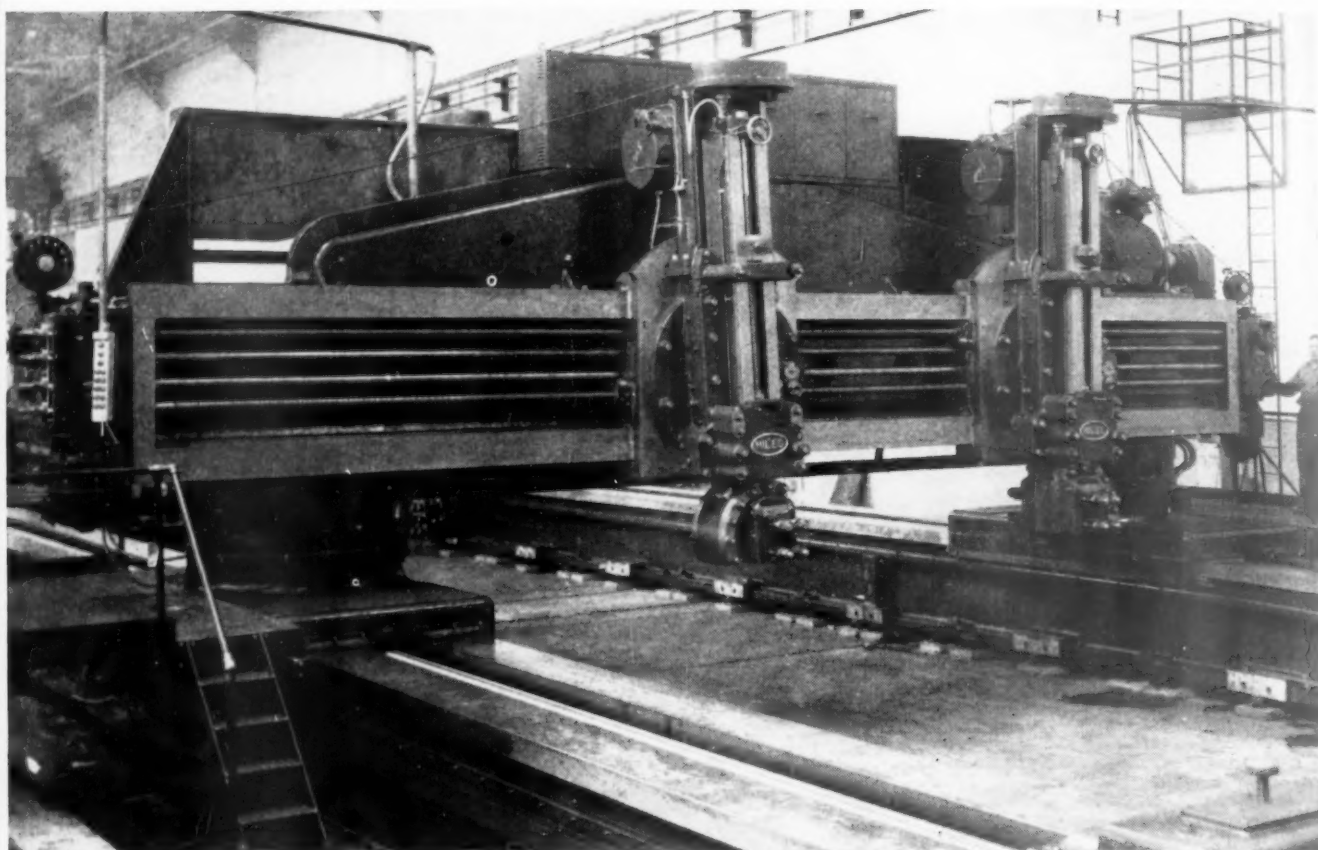
Below. Gordon R "Plan-O-Mill" is a good example of the new planetary drive type machine for forming and thread milling.



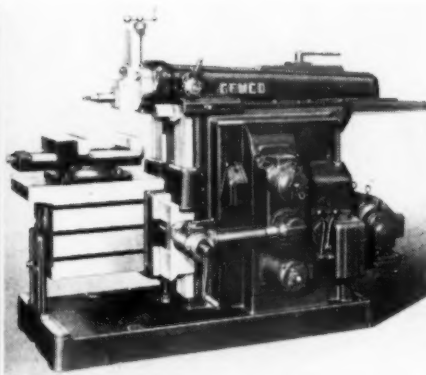
Below. Hardinge precision knee type horizontal miller.



# PLANERS --- SHAPERS

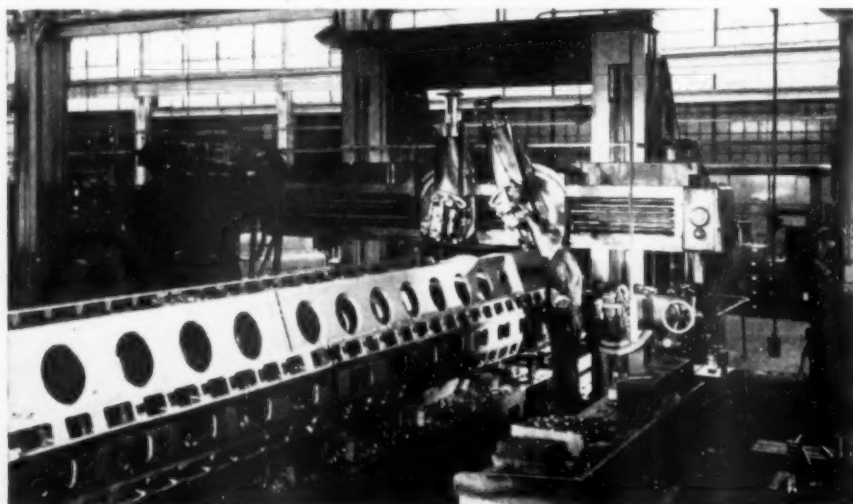


Above. Cincinnati Shaper typical of heavy duty type. In sizes from 16 to 36 inch stroke.



Above. Latest crank type Gemco Shapers are built in two sizes 16" and 24". Rigid construction for accuracy.

Below. General Motors Diesel Engine crank cases being finished on a typical reciprocating table planer.



Niles armor plate planer of radically new design with a stationary table and moving cross rail. On one side of the rail are carried two longitudinal cutter heads. On the other side a traverse cutting head is provided.

★ ★ ★ ★ ★ ★ ★ ★

## Q-5-PLANING MACHINES-STANDARD (DOUBLE COLUMN)

Include only machines used for miscellaneous planing. Do not include wood-working planers.

Cincinnati	Sellers, No. K
Cleveland	Niles
Liberty	Newton
Gray	

## Q-6-PLANING MACHINES-OPEN SIDE

Include only machines used for miscellaneous machine-shop planing. Do not include wood-working planers.

Gray	Sellers
Rockford	Liberty
Cleveland	

Cincinnati,	30" x 30"
	36" x 36"
	48" x 48"
	60" x 60"
	72" x 72"
	84" x 84"
	96" x 96"

Newton

## R-4-POLISHING AND BUFFING MACHINES-SPECIAL

Include in this "Special" class those machines which are designed for a special purpose and which cannot be readily adapted to another job. Every reasonable effort should be made to place each machine in one of the "Standard" classes. If a machine is essentially a "Standard" machine, but has a special attachment on it, put the machine in its proper "Standard" class and indicate the special attachment by the abbreviation "S.A."

Sommer & Adams  
W. V. Robinson

## R-6-POLISHING AND GRINDING AND BUFFING MACHINES-COMBINATION

Include only two-wheel, horizontal-spindle machines where one wheel is used for grinding and the other wheel is used for polishing or buffing.

U. S. Electrical	Hisey-Wolf
Blount	Cincinnati

## R-7-POLISHING AND/OR BUFFING MACHINES-TWO-WHEEL

Include only two-wheel, horizontal machines designed exclusively for polishing and buffing. These machines are known also as polishing lathes or jacks or polishing stands.

L. Hommedieu	Cincinnati
Hisey-Wolf	Gardner
Acme	Hammond
Bridgeport	

★ ★ ★ ★ ★ ★ ★ ★

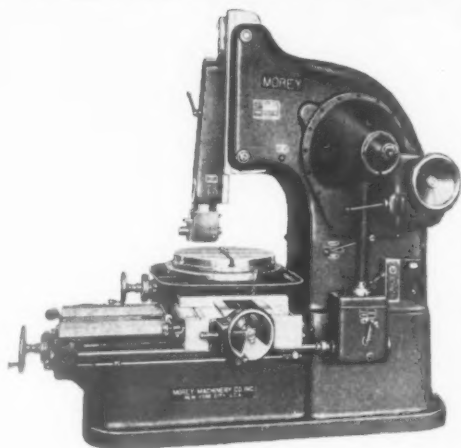
THE TOOL ENGINEER

# POLISHING MACHINES



Close up of a vertical shaper in action showing how it is used in production. (Left, Above)

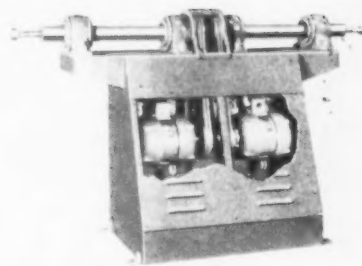
Above. Airplane propeller being polished with a Marschke swing frame buffer. Below. Hammond cylindrical belt polisher for parts 1/4 to 9" in diameter.



Morey vertical shaper with indexing turn table and longitudinally adjustable bed. (Left)



New more rigid design Vernon 11" shaper designer to work to close tolerances.



Below. Small, fast and accurate machining can be done on this tool room Atlas shaper.

Above. Torg Electric Mfg. Co. makes a completely enclosed motor driven butting lathe.

★ ★ ★ ★ ★ ★ ★ ★

Mitchell Sommer & Adams  
E. S. Electrical Tool Co. W. V. Robinson

## R-8—POLISHING AND BUFFING MACHINES—SEMI-AUTOMATIC—CONTINUOUS

Include only machines designed with a multiplicity for polishing heads and work-holding fixtures arranged in a straight line, or in two parallel lines with a return loop at both ends for continuous polishing or buffing uniform or irregular surfaces.

Udylite Acme  
Munay-Way Devine  
Sommer & Adams  
Packer

## R-9—POLISHING AND BUFFING MACHINES—SEMI-AUTOMATIC—INDEXING

Include only machines with an indexing table and with a multiplicity of revolving work-holding spindles, and one or more polishing heads, for polishing or buffing round or curved surfaces.

Udylite Devine  
Munay-Way W. V. Robinson  
Acme Sommer & Adams

## V-1—SHAPERS—HORIZONTAL

Include only shapers having a horizontal, reciprocating ram. Do not include wood-working shapers nor gear shapers. (Gear shapers are classed as gear cutting machines.) See also GEAR MACHINES—CUTTERS—SHAPERS—Classification J-7.

Gould & Eberhardt, 14", 18"-16-20, 20"-20-24, 24", 32", 36"  
Hency  
Cincinnati  
American  
Morton  
Rockford, 12", 16", 20", 24", 28"  
Kelly 16", 20", 32"  
Ohio  
Stockbridge  
Smith & Mills  
Vernon

## V-2—SHAPERS—VERTICAL

Include only shapers having a vertical, reciprocating ram. (Known also as Slotters.) Do not include wood-working shapers nor gear shapers. (Gear shapers are classed as gear cutting machines.) See also GEAR MACHINES—CUTTERS—SHAPERS—Classification J-7.

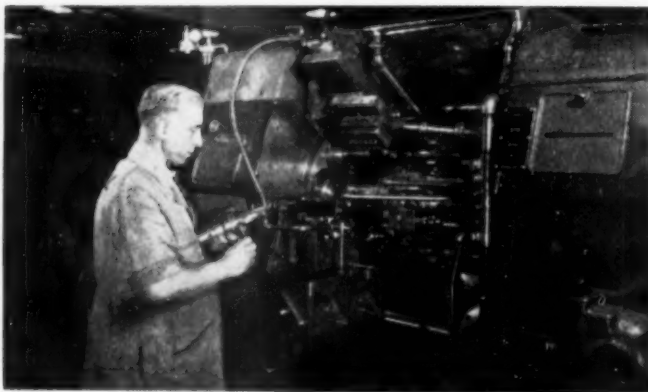
Hanson Whitney Dill  
Pratt & Whitney Cochrane & Bly, No. 14  
Rockford, 12", 20" Jones, 6", 12"  
Morey 8", 12", 16"

★ ★ ★ ★ ★ ★ ★ ★

MARCH, 1942



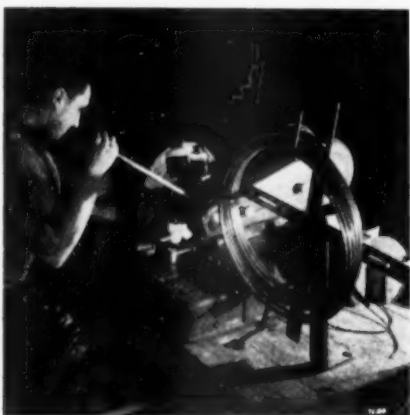
# AUTOMATIC SCREW MACHINES



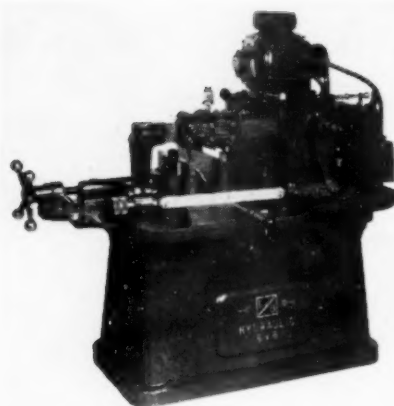
A 6 spindle Acme-Gridley automatic screw machine — like hundreds in use today.



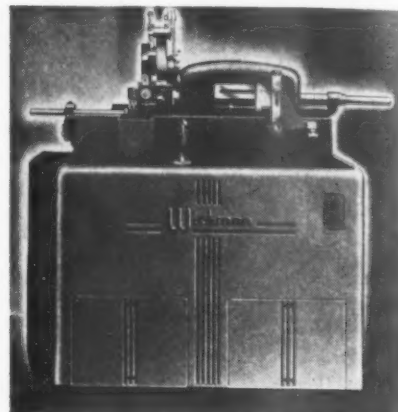
Greenlee automatics are of the wide open multiple spindle type — tools easily reached.



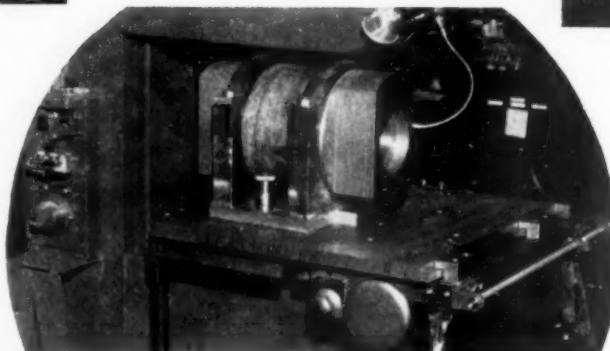
Above. Delta disc saw used to cut off tubing and light bar stock.



Above center. L/B Hydraulic power hack saw with cutting capacity up to 6 x 6 steel bars.

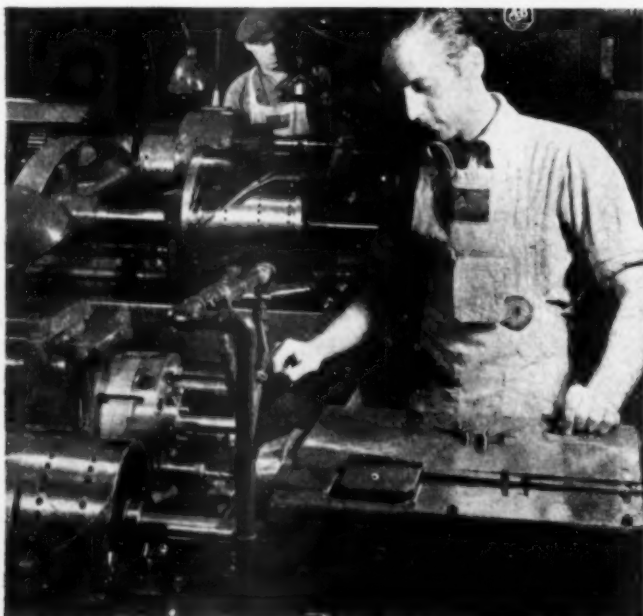


New Wickman Swiss-type Automatic Lathe for small precision parts like clock pinions and striker pins.



Below. Typical single spindle Cleveland Automatic Screw machine with drum type cams shown in photograph.

Easy to do with a DoAll steel band saw. Cutting engine crank pin from solid steel billet. Releases shaper or milling machine for war work.



Below. Latest Brown and Sharpe type of automatic screw machine.

# SAWS-TAPPING-THREADING



## T-5—SAWS—METAL—ABRASIVE CUT-OFF

Include machines using an abrasive disc, operating at high speed for cutting metal. See also CUTTING-OFF MACHINES—METAL—E-5.

Delta  
Lafayette (DeSanno)  
Hunt  
Cincinnati 18"  
Bridgeport  
Campbell  
Gilman

## T-6—SAWS—METAL—HACK (POWER)

Include all machines for cutting metal bar stock, blanks, etc., using a hardened steel blade with suitable cutting teeth and operated by reciprocating power mechanism.

Peerless  
Racine Nos. WBR, 26C, 30C, 35C  
Marvel 6", 9", 18"  
Robertson  
Sigrett  
Atkins  
Armstrong & Blum  
Rasmussen

## T-7—SAWS—METAL—BAND

Include all machines for cutting metal bars, blanks, sheet metal castings, etc., using a hardened steel band with suitable cutting teeth.

Crescent, 20", 26", 32", 36"  
Klemm  
Moak, 20", 26", 32", 36"  
Napier (Horizontal)  
DoAll (Continental Machine Specialties)  
Wright  
Delta  
Racine  
Marvel

## U-5—SCREW MACHINES—AUTOMATIC

Include turning machines designed to produce parts from bar or wire stock fed through the headstock. They may be single or multiple spindle. Machine automatically performs a series or cycle of operations.

New Britain, Nos. 40, 41, 60, 146  
Brown & Sharpe, Nos. 00, 0, 2  
Cleveland  
Greenlee  
Davenport, Model B  
Billings & Spencer  
Gridley  
Cone, "Conematic"  
National Acme, "Acme-Gridley"  
RA 3/8" to 4 1/2"—4-spindle  
RA 3/8" to 3 1/2"—6-spindle  
RA 1 1/2" to 2 1/2"—8-spindle  
Foote-Burt, 1 Sp.

## W-5—SHEARS—CUTTING STOCK

Include shears for cutting rounds, flats and squares for all forging purposes.

Buffalo  
Long & Allstatter  
Canton

## W-6—SHEARS—ROTARY

Bliss  
Cleveland  
Niagara

## X-5—TAPPING MACHINES

Include machines made especially for tapping including nut tappers. Do not include machines which drill and tap nor drilling machines which have tapping attachments, nor drilling machines which have been converted into tapping machines, such machines should be classified as drilling machines. See also DRILLING MACHINES and THREADING MACHINES—Classifications H and Y.

Garvin  
Gastman  
Haskins  
National  
Holmes  
Avey  
Allen  
Baush  
Foote-Burt  
Greenlee (Special)  
Ingersoll (Special)  
Demco  
Simmons

## Y-5—THREADING MACHINES—DIES OR CHASERS

Include only machines designed especially for producing external threads—See TAPPING MACHINES and DRILLING MACHINES—See Classifications X and H—Include machines which cut threads from dies or chasers. Do not include automatic, hand screw machines, lathes, thread milling machines, thread rolling machines, pipe threading machines; each of which has a separate classification.

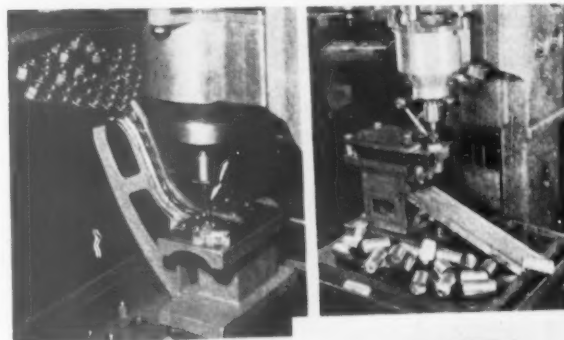
Fox  
Landis  
Murchey, No. 98  
Geometric  
Webster & Parke  
Acme  
Holmes, No. 20  
Kent, Nos. 2 and 2A  
Kent Stud Threader



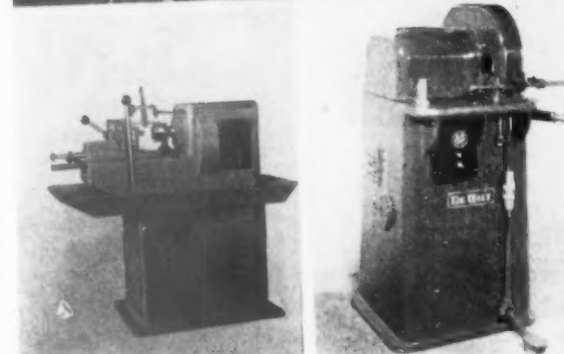
MARCH, 1942



Whiting Rotary Shears cutting up to 14 gage mild steel. They are widely used in aircraft work for cutting large irregular shapes.



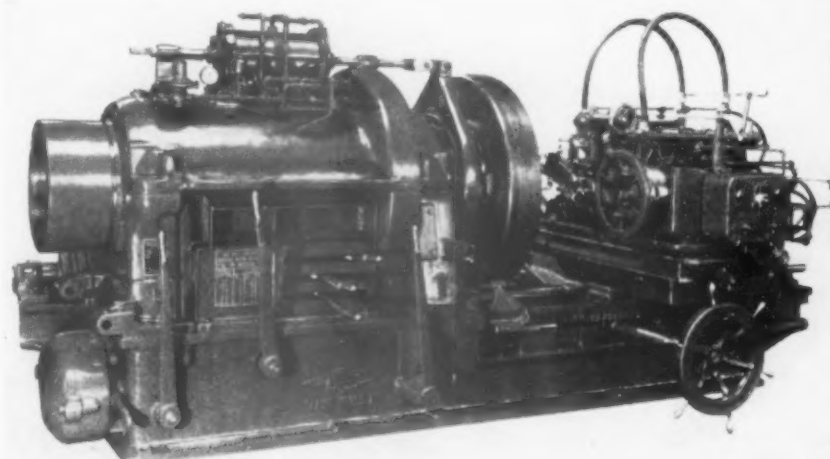
Right. Haskins air controlled nut tappers are shown. From the nut tapping fixtures shown, 1800 (3/8"-16) steel nuts are threaded per hour. The automatic air operated Haskins vise shown makes the tapping of thin metal parts accurate, safe and fast.



Right. Geometric threading machine. Capacity National Coarse threads up to 1" diameter and fine threads up to 1 1/2" in diameter. Use where precision threading of production parts is vital.

Below. Huge bomb turning and threading machine made by Landis Tool Company. This machine might be classed as a Chucking Lathe as well as a threading machine. Thread chasers are used

Above. De Walt "cut off" machine of the disc type for parts up to 2" diameter.





## WASHINGTON LETTER

By A. N. WECKSLER

Washington Correspondent for  
THE TOOL ENGINEER

Freezing sales to stimulate war production. New plant-by-plant conversion plan. Price ceiling on machine tools. Shortage of perishable cutting tools a handicap.



USING the technique followed in the case of the automotive industry, the War Production Board is calling a halt on civilian production as a means of forcing large scale conversion on civilian consumer goods industries.

The general plan calls for a quick succession of actions designed first to inform a particular industry that it is slated for a production stoppage, and then to freeze sales. By informing an industry that it must convert, Government officials plan to give the industry in question an opportunity to adjust itself to war production operations. By freezing manufacturers' stocks, WPB aims at preserving a stockpile for future rationing. It is planned to stockpile a sufficient supply to meet consumer demand for a period of two years.

It is not believed that production of so-called "Victory models" will be launched until stockpile reserves are exhausted and consumer requirements become so pressing that some type of durable goods production becomes necessary.

Late fall of this year will see consumer goods industries converted to war work on a large scale. It is estimated that the automotive industry will have been adapted to full scale war production by that time. Approximately 90 percent of automotive plant capacity, it is claimed by WPB

officials, will be able to undertake either direct military production or fabrication of essential civilian transportation needs. Ten percent of plant facilities will continue in production of spare parts.

Other industries slated for conversion are domestic refrigerators, radios, business machines, and washing machines.

In charge of conversion is James S. Knowlson, director of the Division of Industry Operations. This Division is the key operating agency of WPB, and directs industry branches as well as priorities. It is Knowlson's contention that industry should be converted plant by plant, rather than attempting to convert an entire industry. Premise for this position is that operations within an industry differ. Integrated plants produce all parts of a product and assemble the finished product, while some plants within an industry produce only parts and another group merely assembles the finished product and does not actually fabricate any part of the finished product.

Adoption of this approach to the conversion problem places the responsibility for the changeover from peace-time operations to war work upon individual plant management. Proposals which had been advanced for industry-wide conversion, committees, with labor and management ad-

vising the conversion effort, would not be effective in the plant-by-plant conversion plan.

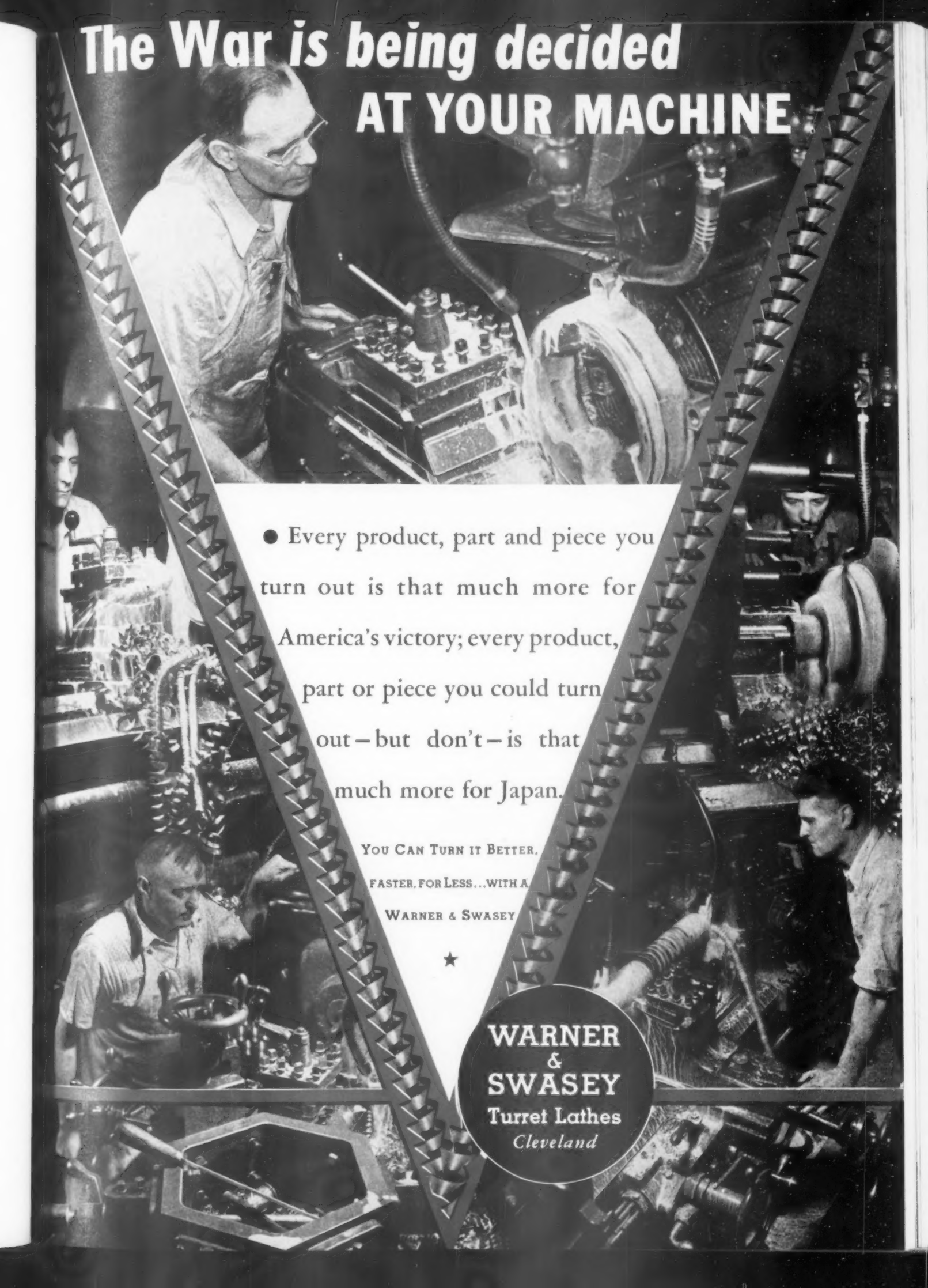
The plan for curtailment in civilian industry production differs in regard to various industries. While the broad grouping of consumer durable goods of the household appliance type seems slated for complete stoppage in production, industries such as the toy industry will be permitted to continue operation, with a significant restriction on the quantity of scarce materials available to the industries.

This concession to these consumer industries is based on the dual factors that their continued operation is necessary to bolster national morale, and that plant facilities of these industries are not adaptable to conversion.

At the same time, the tool and machine shops of other industries are planning to go on a full-shift basis, allocating such time as is not taken up in servicing of their own industries to taking on outside contracts on war production.

An example of this type of operation is the plan worked out for the pulp and paper mills, which maintain fairly adequate machine shops for their own repair and maintenance needs. Under normal conditions, these shops operate one shift. A plan has been worked out to engage idle machine time in these shops through obtain-

# The War is being decided AT YOUR MACHINE



● Every product, part and piece you turn out is that much more for America's victory; every product, part or piece you could turn out—but don't—is that much more for Japan.

YOU CAN TURN IT BETTER.

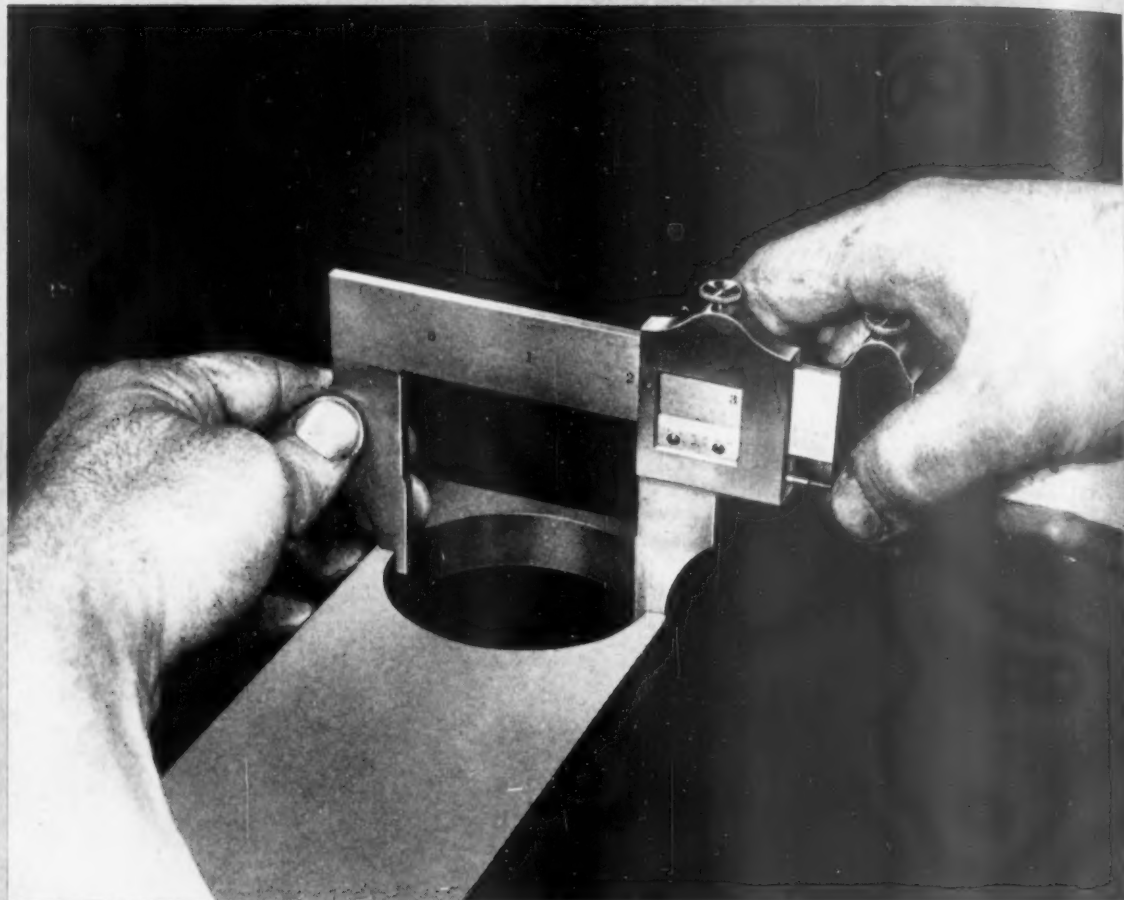
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SWASEY**  
Turret Lathes  
*Cleveland*

*The Measure of*  
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**VICTORY** will be assured once America's fighting forces are supplied with more and better equipment. In striving for increased production, remember that volume is worthless without accuracy. Starrett Tools speed work along through production and inspection with sure, unfailing accuracy. They inspire extra confidence that results in greater efficiency, better, faster work. Write for Starrett Catalog No. 26 T.

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ing subcontracts.

There has been a sharp swing-over in Government purchasing to the use of negotiated contracts, in contrast to the more formal peace-time procedure of advertised bid and acceptance contracts. Use of the negotiated procedure permits Government procurement officers to take individual plant problems into account, and to make some concessions in the case of higher cost producers.

WPB Director of Production William H. Harrison has reported that the machine tool bottleneck is being cleared up by greatly increased building of new tools and wide-scale use and interchange of existing tools by industry groups.

One of the major supply problems being solved is that of expanding production of perishable cutting tools, such as twist drills, reamers, milling cutters, hobs, broaches, taps and turning tools.

With the passage of the Price Control Act, Price Administrator Leon Henderson has broadened the control of prices in the tool field. New machine tools were brought under a price ceiling at October 1, 1941, price levels. The price schedule defines machine tools as "all machines for cutting, abrading, shaping and forming of metals".


Price Administrator Henderson requested all makers of power driven portable tools not to advance prices above the October 1 levels, and issued a formal price ceiling schedule on gears, pinions, sprockets and speed reducers.

The general trend of WPB is toward allocations of materials by industry branches, with priority orders and ratings employed as a distributive mechanism while total tonnages are made available to industry groups on an allocation basis. This procedure is being hastened by the large number of ratings in the highest priority brackets.

This latter condition has brought complaint from such industries as the locomotive manufacturing industry, which has asked WPB to determine what part of their facilities they should devote to their regular lines of production and what part they can use to fill war work.

# Use the PRECISIONAIRE to Gage Internal Diameters

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|--|--|
| Gun Barrels—All Calibers                       | Work Still on Boring Machine or Grinder        |
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| Gun Barrel Rifling                             | Carburetor Bodies and Valve Sleeves            |
| •  | •  |
| Connecting Rod Bearings                        | Engine Cylinders and Liners                    |
| •  | •  |
| Piston Pin Holes                               | Parts Too Heavy to Be Brought to the Gage      |
| •  | •  |
| Step Holes—Several Diameters                   | Bores Too Small to Be Checked Otherwise        |
| •  | •  |
| Cam Shaft Bearings                             | Highly Finished Bores Vulnerable to Scratching |
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The Sheffield Precisionaire is extremely fast in action, has the highest degree of accuracy in both process and final inspection—may be used either as a limit comparator for checking tolerance or as an indicating gage for classification of parts. It gives an accurate check not only of internal diameter, but bell mouth, out-of-round and average diameter.

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**SHEFFIELD**  
MASTER GAGEMAKERS

# 35 PLANTS *specify TOCCO* for Hardening Armor-Piercing Shot



## Another vital Defense job for TOCCO Induction Heat-Treating



In U. S. A., Canada and England, more than 35 contractors have specified TOCCO Induction Heat-Treating for *speedy, high-quality* hardening of armor-piercing shot. Some of the advantages of this new, simplified electric hardening

process for this vital production assignment:

**Minimizes rejects.** No cracking problems. Split-second accuracy assures uniform results. Shot individually treated, eliminating risks of conventional batch treatment.

**Doesn't require skilled labor.** Simplified, automatic control permits use of girl operators,

conserving skilled labor for other Defense work.

**Can be installed in assembly line** because unit is clean, cool, compact (only 7 ft. x 5 ft. max.).

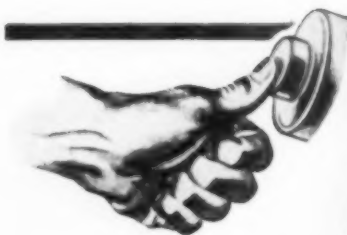
**Matches production requirements.** Makes possible outputs of hundreds, thousands or tens of thousands daily, depending on number of TOCCO units used and their size (20 to 125 K.W.).

**For peace-time, too.** 99% of TOCCO Jr. machines for Defense jobs are *standard*—adaptable to peace-time jobs by simply changing the work fixture.

Our production of TOCCO machines has been expanded 600% to meet vital defense demands. We're at your service!

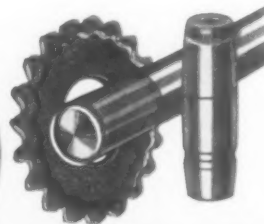
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# PRODUCTION PERSPECTIVES...

News of Mass Manufacturing Everywhere



**E**XTENSIVE surveys of machine tools in American plants undertaken by the Production Division of the War Production Board are putting many an idle, once considered obsolete, machine to work, as well as decreasing the leisure hours of more youthful models.

Unless a machine tool is working 120 hours a week it is considered to be a slacker in doing its share in the production of war material for our fighting forces. Long lists are being revised weekly and distributed among machine operators so that they can spot an available tool from which they can get help.

Some of these machine tools are so old they don't even give their age. But some have heritages that make their owners brag about their long, useful careers. Many of these old timers have poor tolerances, but they are being used for rough work, saving the more exact modern machines for the finishing work.

There is, for instance, the huge, old planer in a shop in Providence, R. I., that is working away on orders for its fourth war. It smoothed deck plates for the Monitor, the Civil War ironclad vessel that was a forerunner of today's steel dreadnaughts. Certain lathes and other faithful machine tools that turned out parts for the engine for that famous war ship also are enlisted for the duration of the present war. Some descendants of the early foundries of the same shop are still active.

Another war-tested veteran is the vertical boring mill in Al-

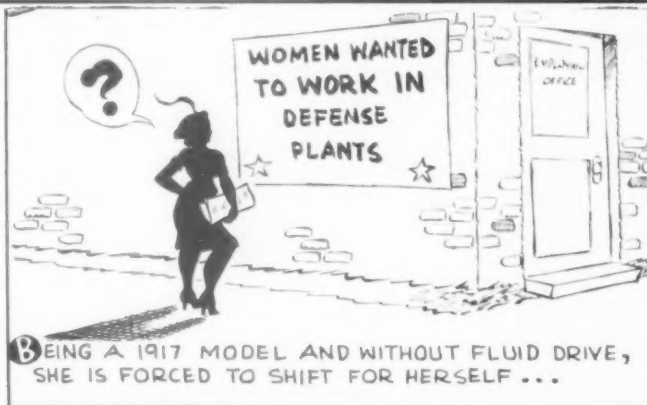
lertown, Pa., that was built in 1865 and first produced parts for pumps used in the last year of the war between the States. Through the Spanish-American and World Wars the mill turned out large metal rings used in the construction of heavy machinery. In the last few years it has been idle more often, but from time to time it did miscellaneous work such as milling rough pieces for dredge pumps and iron tires for cement kilns.

Now the same old machine is planing gate castings for a dry dock for the Navy. It is operating some 40 hours a week and "wants more work" on castings up to eleven feet square.

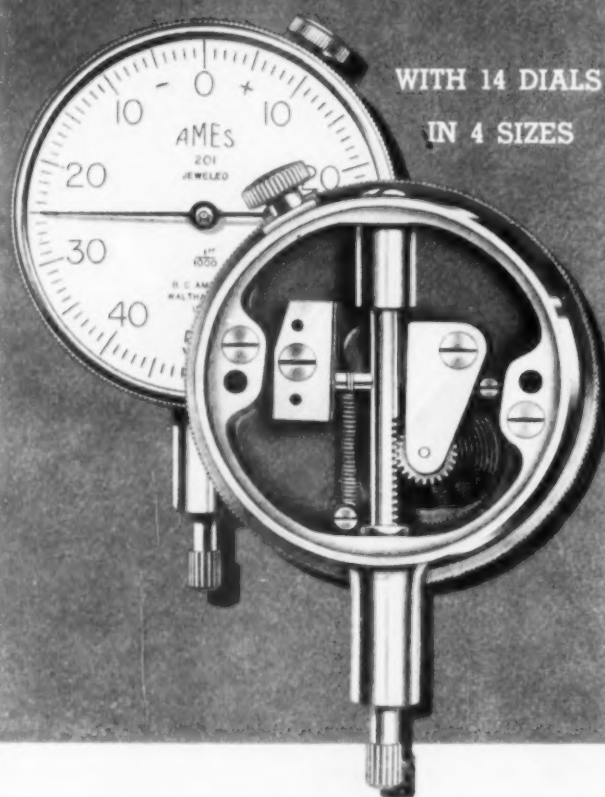
Another Civil War veteran is a steam hammer in Milwaukee which shop men have had to nurse along to keep it pounding. Often pieces of the cast iron and steel frame have disintegrated from old age and use, but spare parts on hand for just this reason are put in place immediately and stoppage of work on steel forgings for the Navy is held to a minimum.

Machine tools that were the pride of the Gay Nineties also are finding themselves the center of attraction again. Many of these relics of another age have stood silently over in neglected corners of plants. There is a planer, owned by an electric company in Lynn, Mass., that was the hit of a display at the World's Columbian Exposition held in Chicago in 1893. After many years of service the planer was replaced by a more modern one and the depression that finally caused its abandonment saved it from the junk heap. The cost of dis-

## "GREENIE" Hunts a Job!



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These Dial Indicators have all the desirable features for measuring and checking accuracy. Four sizes to American Gage Design Committee specifications. Fourteen different dial numberings. One-piece, drop-forged cases and stems. Wire attached bezels. Cup-shaped dials that need no springs beneath. Pinions and staffs of hardened steel, ground for accurate fitting and long wear. Various styles of backs and contact points. The best and most effective shock-absorbing wheel assembly, optional.

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**B. C. AMES CO.**  
WALTHAM, MASS.

## PRODUCTION PERSPECTIVES

mantling the machine would have been more than the return from the metal on the scrap market.

Floor space was not a problem because there was more in the plant than was needed. So the old machine gathered cobwebs and dust for a decade. When the company got into its war production program, there was no such thing as unneeded floor space or dust-gathering machinery. Engineers looked at the Exposition Star and soon were hard at a remodeling job. The cost of modernizing the planer was considerably less than the price of a new one, and furthermore there wasn't time to wait for a new one. Since actual production is more important than maximum efficiency, the old planer is doing all right on a Navy contract despite its half-century age.

Production from the old machines is still only a minor part of the war program but it illustrates the efforts being made to get all possible work from all possible tools.

Manufacturers of cutting tools have been warned by the Director of Industry Operations that beginning July 1 at the latest they must use the Production Requirements Plan to obtain priority assistance.

Manufacturers of sporting fire-arms were ordered on February 23, to make no further deliveries of 12-gauge shotguns, except to agencies and officers of the Federal, State, and local governments, for official use, and to the governments of the lend-lease countries.

Another provision of the order prohibits manufacturers from using machinery which can be employed to assemble or manufacture 12-gauge guns for the purpose of turning out shotguns of other sizes.

Small and medium-sized manufacturers are becoming increasingly important in the war effort. A complete survey of the manufacturing facilities is the first step of every manufacturer who wants war work. This survey should begin with the firm's business record and should include a description of normal products made in the plant, the experience of managerial and supervisory personnel, previous war production experience, a financial statement and names of past and present customers for reference.

The manufacturer should take stock of his labor situation. In the survey he should list the number of his factory employees, their skills, peak employment of the plant for one, two and three shifts, a description of the available labor supply and the competition for it and a brief analysis of existing and nearby wage rates.

Then he should take stock of the plant and its equipment, describing location, transportation facilities, available power and water facilities and similar production factors.

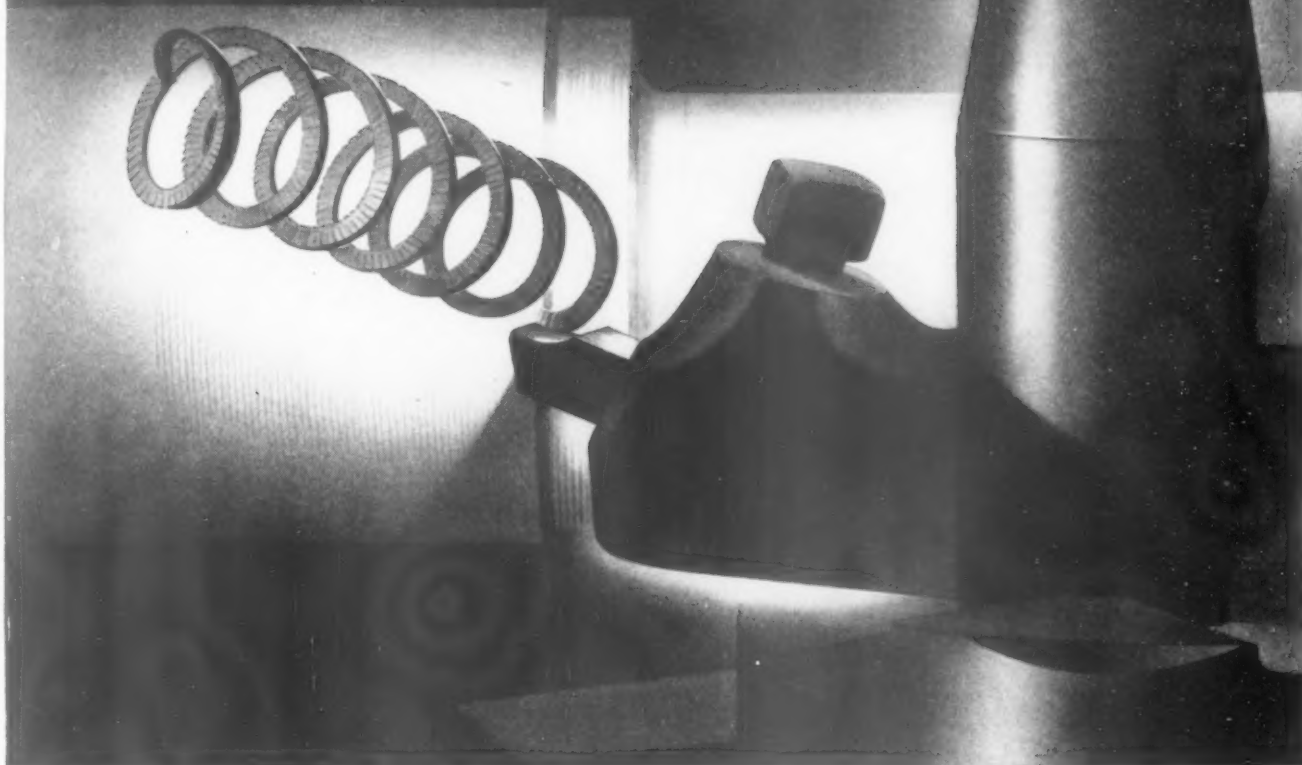
Complete layout plans—accompanied by photographs—should be made of each section of the plant. Finally, a list of all tools should be drawn in which the type, make, age, size and serial number, as well as the tolerances usually followed are included.

His survey will do him most good at the following places: the nearest field office of the Contract Distribution Branch of the War Production Board, the Army's District Procurement Office, the Navy's Bureau of Supplies and Accounts and local prime contractors.

In a dramatic race against time, the Van Norman Machine Tool Company of Springfield, Mass., moved all the machinery from its old plant into the four story plant it acquired last year from the National Equipment Company.

Van Norman's products are vitally important to the defense efforts and to the lend-lease assistance. Van Norman has more than \$5,000,000 worth of defense orders and approximately \$250,000 of Russian orders.

**... Ask your supplier about  
Molybdenum high speed steels.  
Experience proves they pay.**



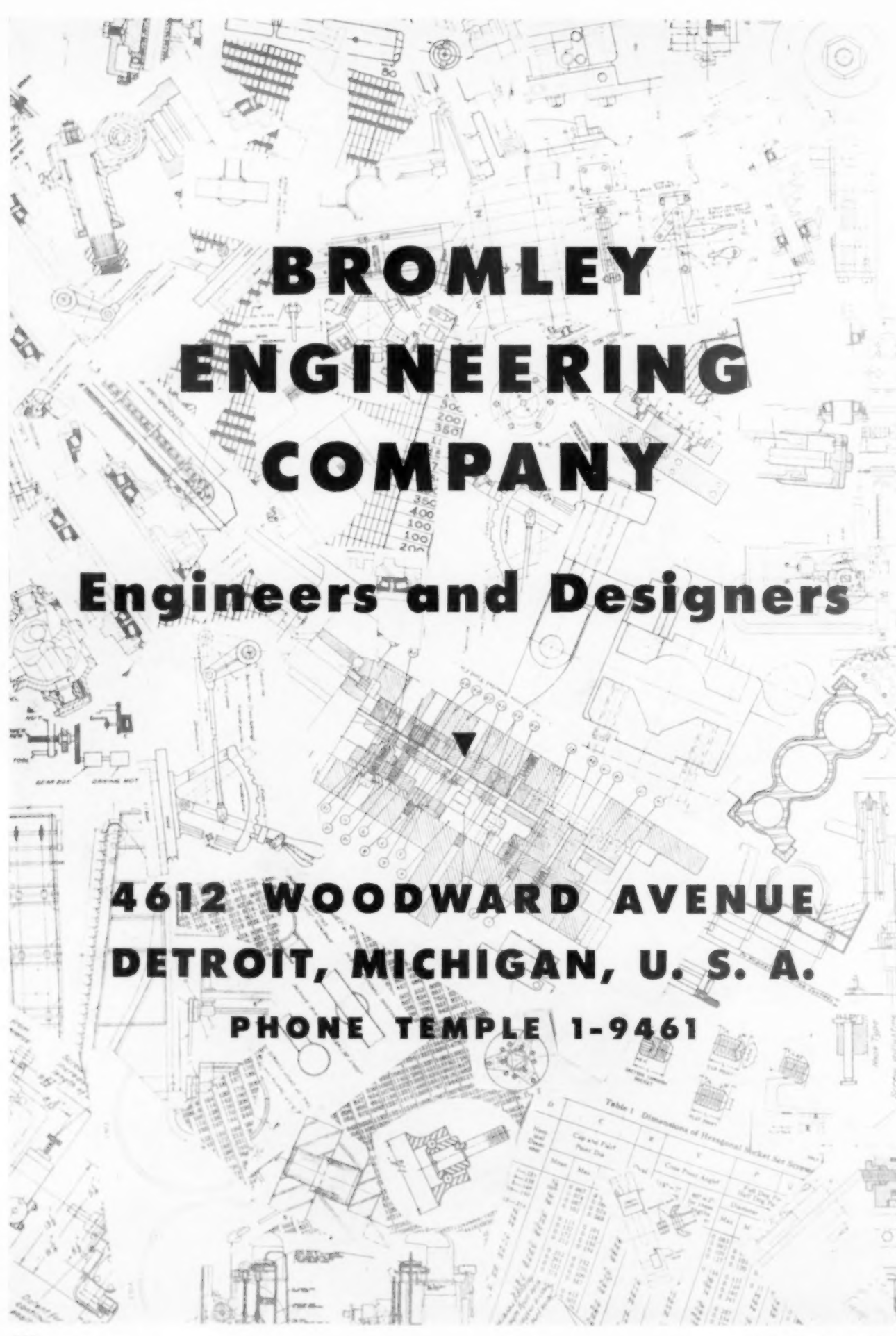
You know what you want from your cutting tools. Here's what users are getting from molybdenum high speed steels, in comparison with the tungsten types.

Equivalent cutting properties      Greater toughness      Lower cost

These are facts — with nine years' experience in thousands of shops to back them up. Check cost and performance records with any user you like. See your supplier for the proper analysis and heat treatment for your requirements.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.  
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • CALCIUM MOLYBDATE

**Climax Molybdenum Company**  
**500 Fifth Avenue • New York City**



The background of the advertisement is a detailed technical drawing. It features various mechanical components, including gears, shafts, and housing parts, rendered in a precise line-drawing style. In the lower right quadrant, there is a table titled "Table I Dimensions of Hexagonal Rods and Screws". The table has several columns with headers like "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X", "Y", "Z". The rows contain numerical data, likely representing dimensions in inches or millimeters. The overall layout is a professional engineering drawing, typical of a technical manual or a company's design portfolio.

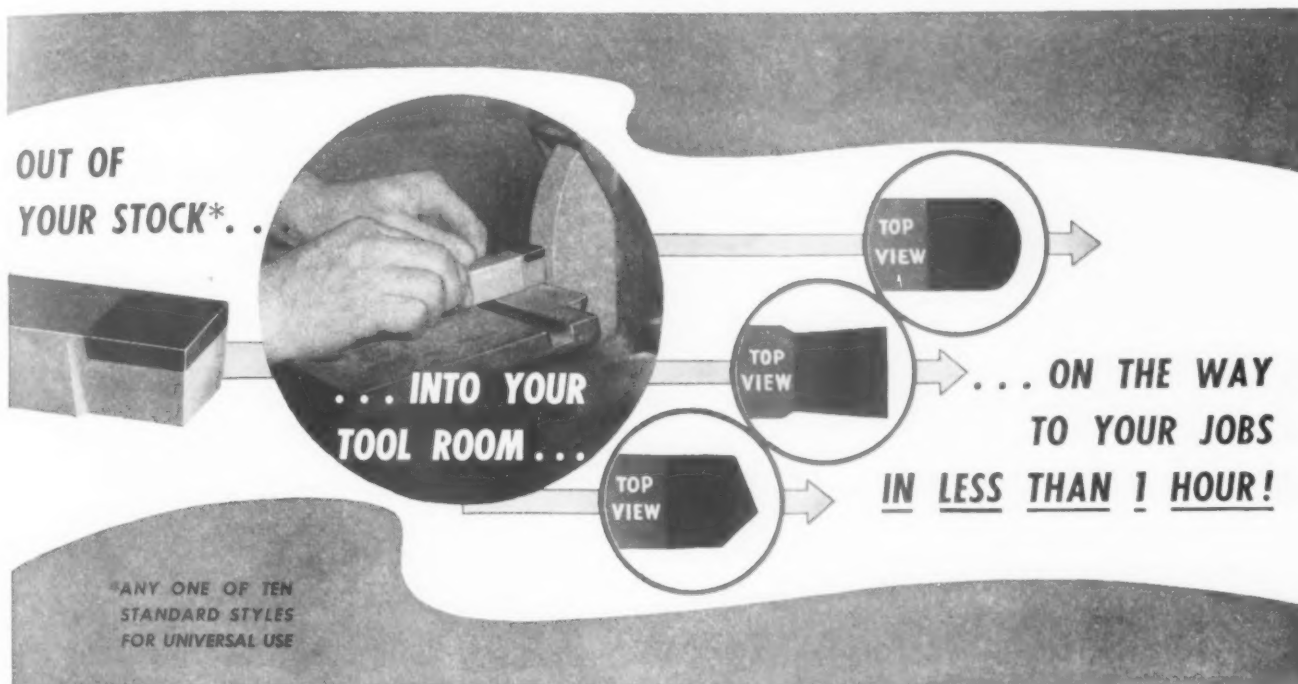
# **BROMLEY ENGINEERING COMPANY**

**Engineers and Designers**

**4612 WOODWARD AVENUE  
DETROIT, MICHIGAN, U. S. A.**

**PHONE TEMPLE 1-9461**

# How To Get "Special" Carboly Tools On Your Job In Less Than One Hour!



Busy production executives who want to establish a way to get specially shaped carbide tools on machining jobs **FAST**, can save time and money and get immediate results by following this simple, practical plan:

1. Have your tool designers select Carboly Standard Tool styles suitable for quick adaptation to your special shapes.
2. Establish, in your tool crib, a nominal stock of the standards your designers select.
3. Grind these standards to special shapes as required.

This standardization plan is being followed today by many leading producers of tanks, engines, shell, guns, small arms and other war materials. It permits maximum tool economy, eliminates delivery delays and provides a way to get special tools on the job **FAST!**

Send for catalog GT-140.

**CARBOLOY COMPANY, INC.,** 111 45 E. 8 MILE ROAD, DETROIT, MICH.

Chicago • Cleveland • Los Angeles • Newark • Philadelphia • Pittsburgh  
Seattle • Worcester, Mass.

Canadian Distributor: Canadian Electric Co., Ltd., Toronto, Canada

## CARBOLOY STANDARD-STOCK TOOLS

Adaptable to 80% of  
all turning, boring and  
facing applications.

Send  
for  
free  
catalog  
→



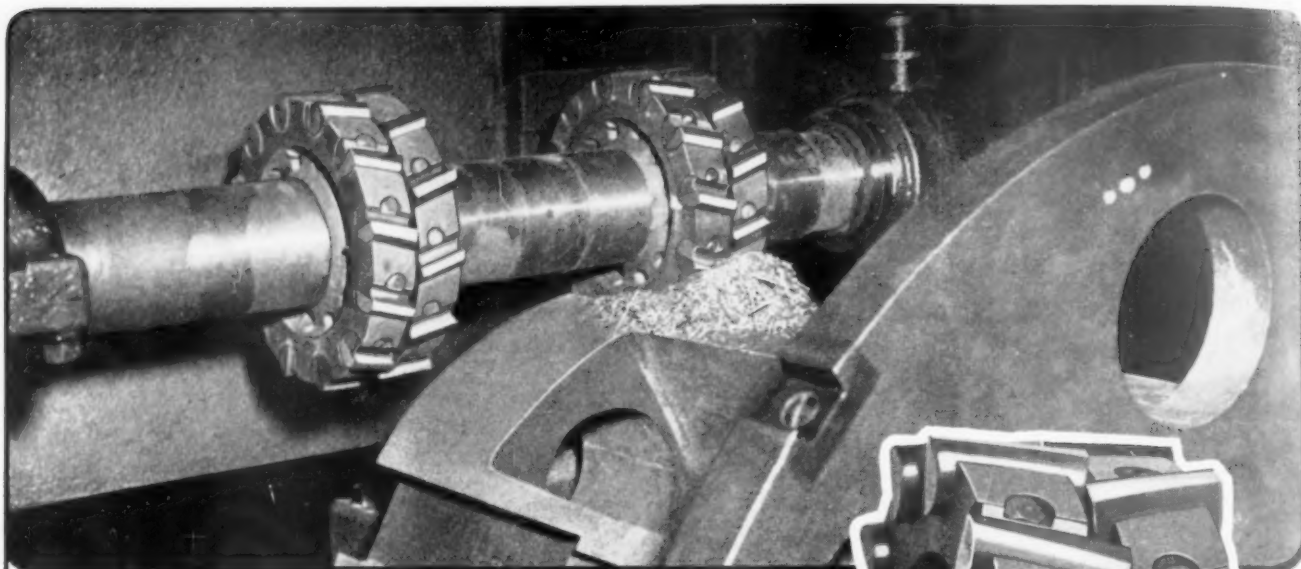
# CARBOLOY

Reg. U.S. Pat. Off.

**CEMENTED**  
TOOLS • DIES • DRESSERS  
CORE BITS • MASONRY DRILLS  
• WEAR RESISTANT PARTS •  
**CARBIDES**



FOR THE MANUFACTURING • MINING • TRANSPORTATION • CONSTRUCTION INDUSTRIES



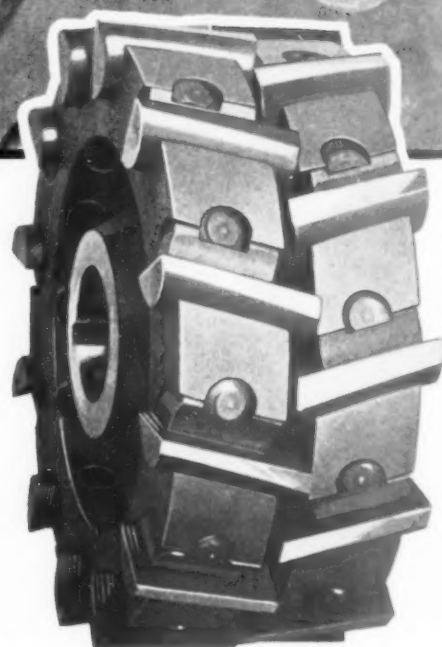
# LOVEJOY

TYPE D

## MILLING CUTTERS

PILE UP THE CHIPS—

PILE UP THE PROFITS



Watch the chips pile up when you mill with Lovejoy Cutters — and keep an eye on the cost sheet. That is where our customers find that Lovejoy Cutters make the big difference.

The Type D Mill shown here can be used singly in face widths from one to two inches inclusive, or in gangs for widths beyond two inches. Either right or left hand tooth angles are available. And Lovejoy Type D Mills have hardened steel housings and *Positively Locked*, interchangeable blades of exclusive Lovejoy design.

No matter what your milling requirements — it will pay to call on Lovejoy.



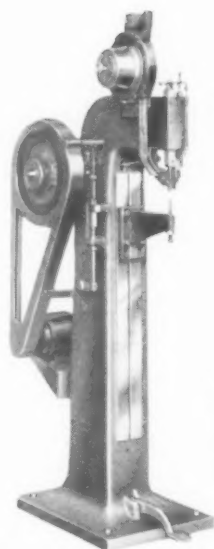
Ask for Catalog No. 26 for complete details on the modern LOVEJOY line of milling cutters.

**LOVEJOY TOOL COMPANY, Inc.**  
SPRINGFIELD, VERMONT, U. S. A.

# A COMPLETE LINE OF AUTOMATIC RIVET SETTERS For Aircraft Production

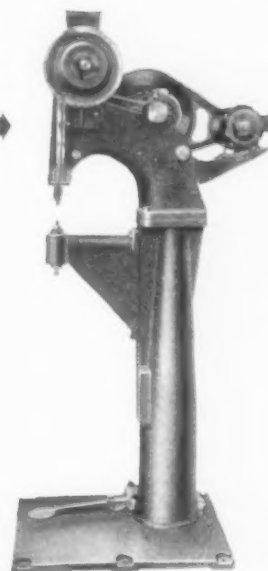
THROAT DEPTH RANGE FROM 6" TO 45"

We also manufacture a full line of INDUSTRIAL Single and Multiple Automatic Rivet Setters

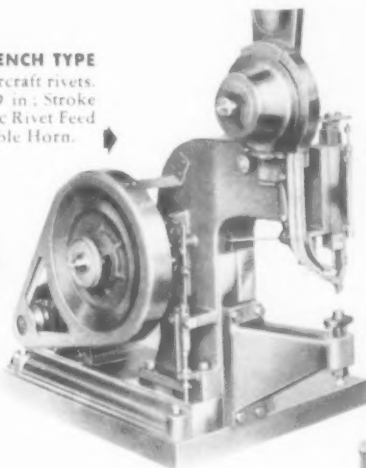
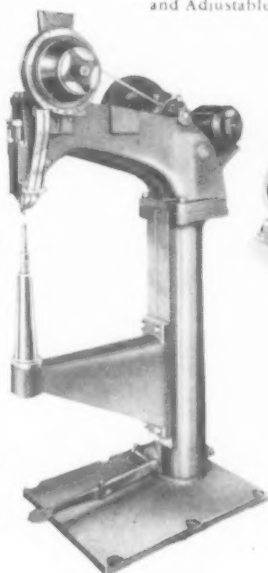


**MODEL 121 FLOOR TYPE**  
Sets 3/16 in. aircraft rivets.  
Throat depth 9 in.; Stroke  
2-2 1/2 in.; Automatic Rivet  
Feed and Adjustable Horn.

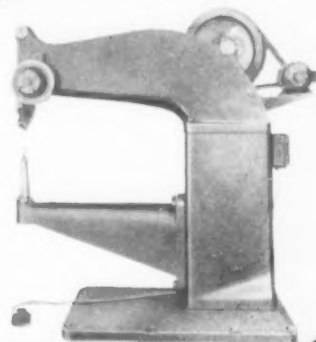
**MODEL 90 FLOOR TYPE**  
Sets 3/16 in. aircraft rivets.  
Throat depth 12 in.; Stroke  
2-3 1/4 in.; Automatic Rivet  
Feed and Adjustable Horn.



**MODEL 71 BENCH TYPE**  
Sets 3/16 in. aircraft rivets.  
Throat depth 9 in.; Stroke  
2 in.; Automatic Rivet Feed  
and Adjustable Horn.



**MODEL 150 FLOOR TYPE**  
Sets 5/16 in. aircraft rivets.  
Throat depth 45 in.; Stroke  
2-4 in.; Automatic Rivet  
Feed and Adjustable Horn.



**MODEL 140PT  
POST TYPE**

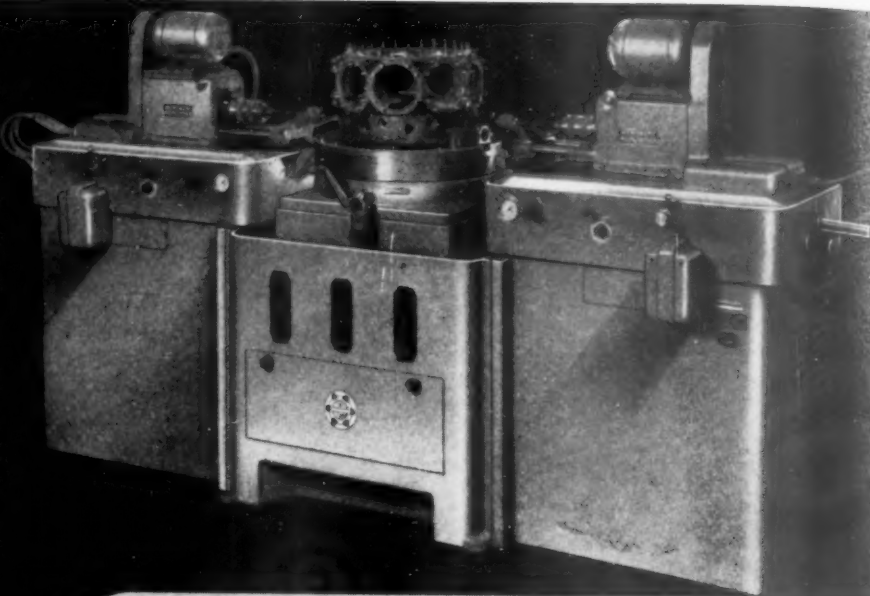
Sets 3/16 in. aircraft  
rivets. Throat depth  
24 in.; Stroke 2-3 in.;  
Posts 6 to 18 in.;  
Automatic Rivet Feed  
and Adjustable Horn.

WE'RE ready to help speed up airplane construction with a complete line of eleven machines for automatic setting of aluminum aircraft rivets. Throat depths: 6, 8, 9, 12, 24 and 45 inches. Production rates, up to 2400 rivets per hour... The clinch of automatic set rivets by Chicago Rivet Machines will meet all requirements of army and navy specifications... Our riveting production experts will be glad to make specific recommendations for your particular needs. To save time, please send blue print or sample assembly when inquiring.

# Chicago RIVET

CHICAGO RIVET & MACHINE CO., 9614 West Jackson Blvd., BELLWOOD, ILL.

Honing valve guides after assembly in crankcase (Radial Aircraft Engine) on Double End Hydrohoner with Micr-O-Size control — production 3 to 6 complete assemblies per hour — removes average of .0005" to .001" stock per bore — generates uniform size within .0003" to .0005", accuracy within .0001" to .0003" and surface finish within 3 to 5 micro-inches, r.m.s.



## AIRCRAFT...—



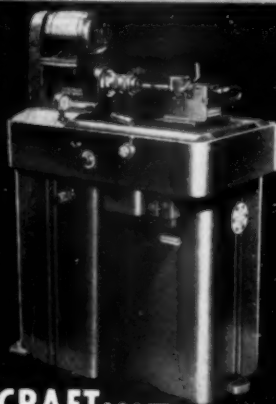
## AIRCRAFT...—

Feathering Oil Pump Gear Teeth (Aircraft Engine) external honing.



## AIRCRAFT...—

Honing Piston Pin Bores (Aircraft Engine).



## AIRCRAFT...—

Honing Valve Guides (Aircraft Engine) before assembly.



## HYDRAULICS...—

Honing O.D. of pistons for a variable delivery pump.

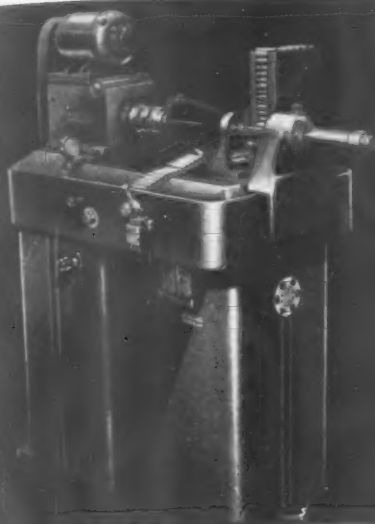
FOR VICTORY PRODUCTION

**SAVE TIME**

**SAVE METAL**

**SAVE COST**

**IMPROVE QUALITY**



Honing cast iron valve guides on full automatic Hydrohoner with Micr-O-Size control—Production 250 pieces per hour. Average Stock removed, .0015" to .0025"—Size within .0005" tolerance; accuracy within .0001" to .0002"; surface finish within 3 to 5 microinches, r.m.s.

Honing Piston Pin holes (in Piston) on Double Spindle Hydrohoner with Micr-O-Size control.



**AUTOMOTIVE....—**

Microhoning has been adopted in most armament production shops to speed up the final processing operation on vital bearing surfaces.

Microhoning generates final surfaces with the minimum amount of stock removal.

Microhoning saves sufficient processing time and cost in some installations, it is reported—even to pay for the machine in 30 to 40 operating days.

Microhoning controls cutting pressure, speed and motion to produce maximum obtainable quality of generated surfaces.

Write for Bulletins AR60 and AR64 for further details.



**MICROMATIC HONE CORPORATION**

1345 E. MILWAUKEE AVE.



DETROIT, MICHIGAN



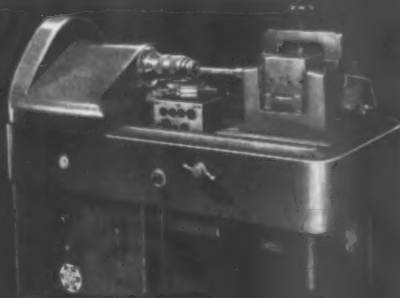
**ORDNANCE....—**

Double Spindle Hydrohoner with Micr-O-Size control for honing gun charger tube bores.



**HYDRAULICS....—**

Honing blind end bores in a variable delivery pump body.



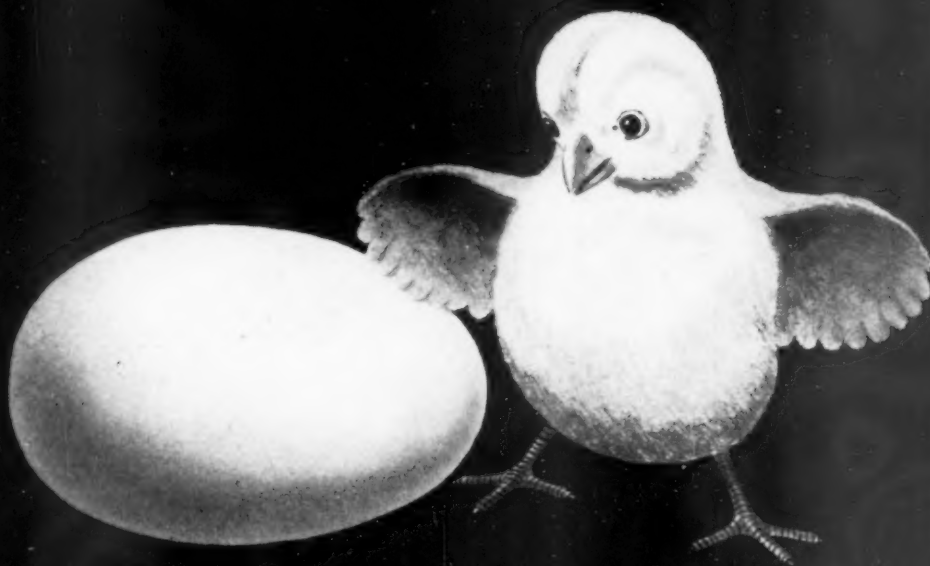
**HYDRAULICS....—**

Honing bores in hydraulic valve body on Micromatic Hydrohoner.

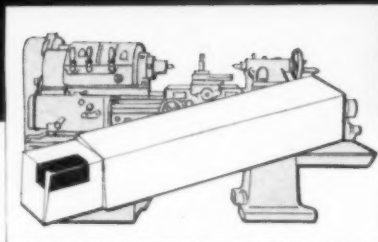


**ORDNANCE....—**

Honing pinion shaft bores in hardened planetary gear for military vehicle.



## WHICH CAME FIRST?



CUTTING TOOL?

MACHINE TOOL?

The answer is easy when applied to the cutting tool vs. the machine tool.

The Cutting Tool always comes *first*—of necessity! Major advances in cutting tools lead to new designs of machine tools.

On new cutting jobs, the selection of the machine tools depends on the kind of Cutting Material to be used.

For example, you must first make a choice

between high-speed steel, super high-speed steel, and a sintered carbide like Firthite. We are makers of all these cutting materials:

**STAR-MO, "Moly" High Speed Steel**  
**BLUE CHIP 18-4-1 High Speed Steel**  
**CIRCLE C Super High Speed Steel**  
**FIRTHITE Sintered Carbide**

Our engineers will be glad to help you find the best type for every job.

# FIRTH-STERLING

## STEEL COMPANY

OFFICE AND WORKS:  
**McKEESPORT, PA.**  
 BRANCH WAREHOUSES:  
 NEW YORK CHICAGO  
 HARTFORD PHILADELPHIA  
 LOS ANGELES DAYTON  
 CLEVELAND DETROIT

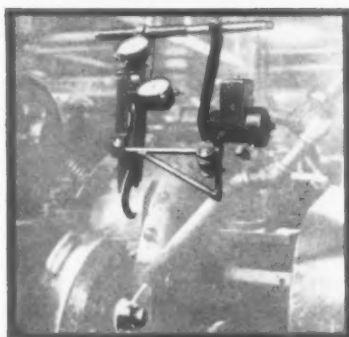
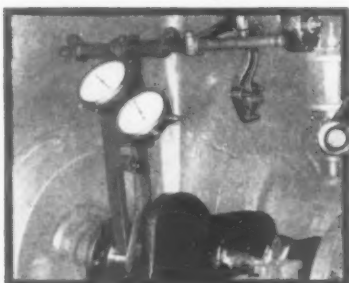
# Don't Stop while grinding - use an ARNOLD AUTOMATIC GAGE

Watch the  
Dial as you  
grind to  
size.



Stopping to gage while grinding is a needless waste of time. Neither is there any excuse for grinding below size and wasting stock. With an Arnold Gage on your grinder you watch the Indicator, and when you reach correct size the work is finished—to correct size. An Arnold hugs the work, positively, and yet sensitively with uniform pressure. Coolant or oil does not harm the gage. Hydraulic Mounting can be adjusted for lifting speed and pressure on the work. An Arnold Gage is an investment worth making. Write—

**FEDERAL PRODUCTS CORPORATION**  
1144 EDDY STREET PROVIDENCE, R. I.



Above—Gage checks width and diameter of crankshaft bearing simultaneously.  
Left—Gage is held out of way while loading ring gear in grinder.

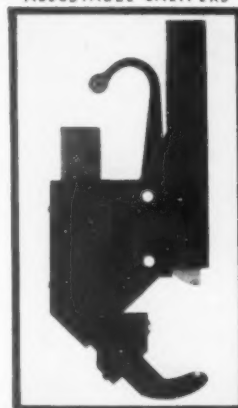
Either inside or outside between faces can also be gaged.



Either inside or outside between faces can be gaged simultaneously with the diameter.



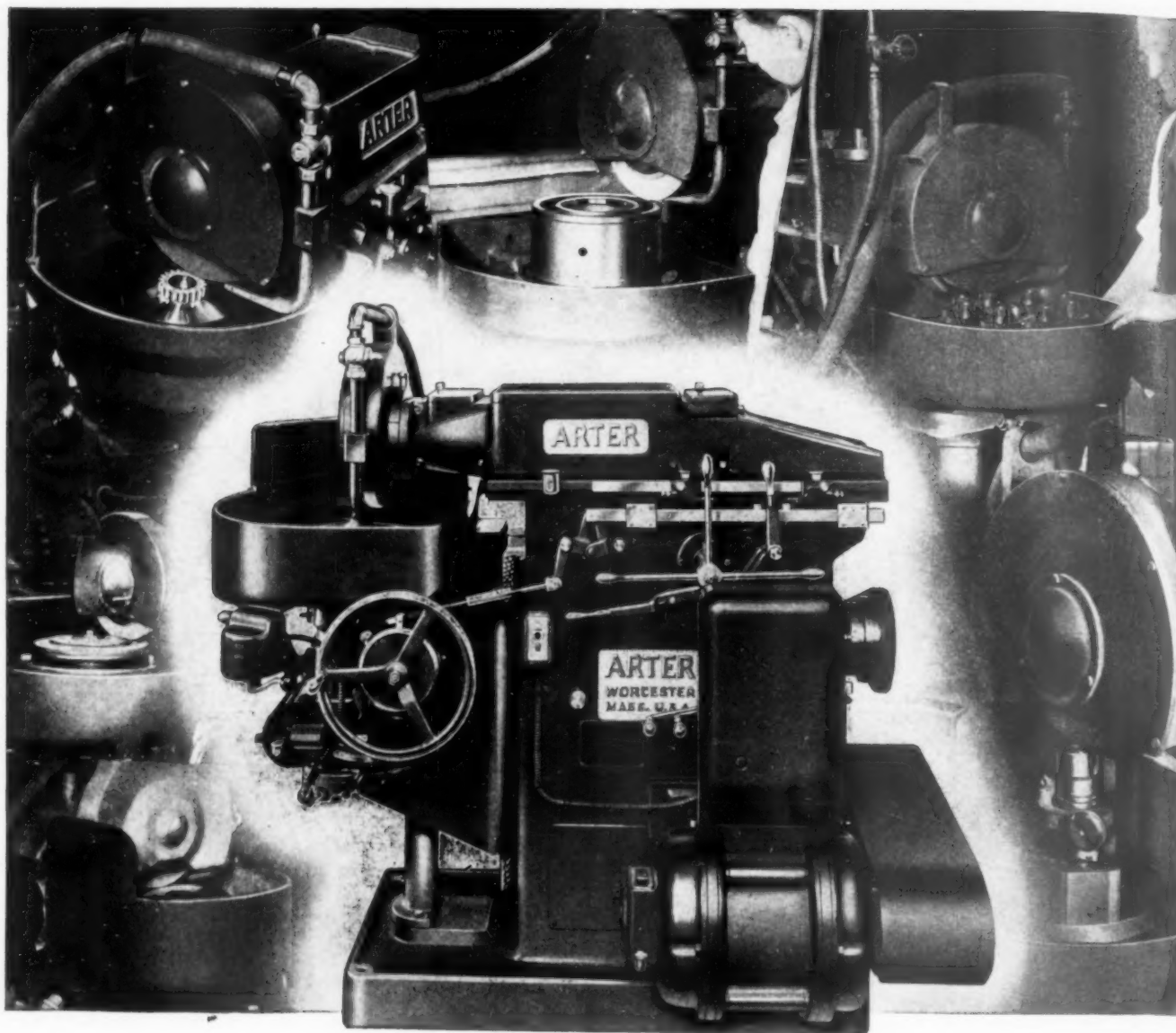
ADJUSTABLE CALIPERS



★ ★ ★ ★ ★ **FEDERAL** ★ ★ ★ ★ ★

PRECISION MEASURING INSTRUMENTS

Chicago • Cleveland • Detroit • Hartford • Los Angeles • Milwaukee • Montreal • Muncie  
New York • Philadelphia • Pittsburgh • Rochester • San Francisco • St. Louis • Toledo • Toronto • Windsor



Here is versatility on a wide variety of production jobs by Arter Rotary Surface Grinder (Model-A). Circular or irregular shapes, held securely by powerful magnetic chuck, or by fixtures, precision ground at high speed. Great vertical capacity. Tilttable work table.

Arter engineering will help you with your particular surface grinding problems.



Thompson Products, Inc. WASTES NO TIME

GETTING INTO *Production*



● In the recently completed Thompson Aircraft Products Company plant, the very first machine tools installed in one large bay shown here were new 5 $\frac{3}{4}$ -inch Model A Cleveland *Single Spindle* Automatics. Maintenance crews were at work when this photograph was made, and not many hours later a steady stream of parts essential to our increasing war production effort was coming off these machines. For small lots and short runs their adaptability and ease of tooling up make Model A Clevelands particularly valuable. You can get descriptive literature for any size Cleveland *Single Spindle* Automatic you might use on request.

**THE CLEVELAND AUTOMATIC MACHINE COMPANY**  
2269 ASHLAND ROAD, CLEVELAND, OHIO

Sales Offices at:

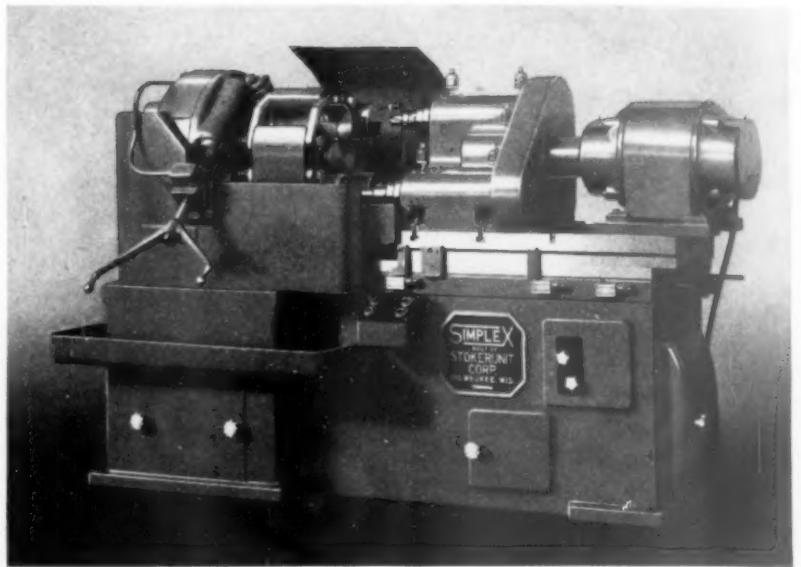
Newark, 15 Washington Street • Detroit, 2842 W. Grand Boulevard  
Chicago, 565 W. Washington St. • Cincinnati, 507 American Bldg.

**CLEVELAND**  
*Single Spindle*  
**AUTOMATICS**

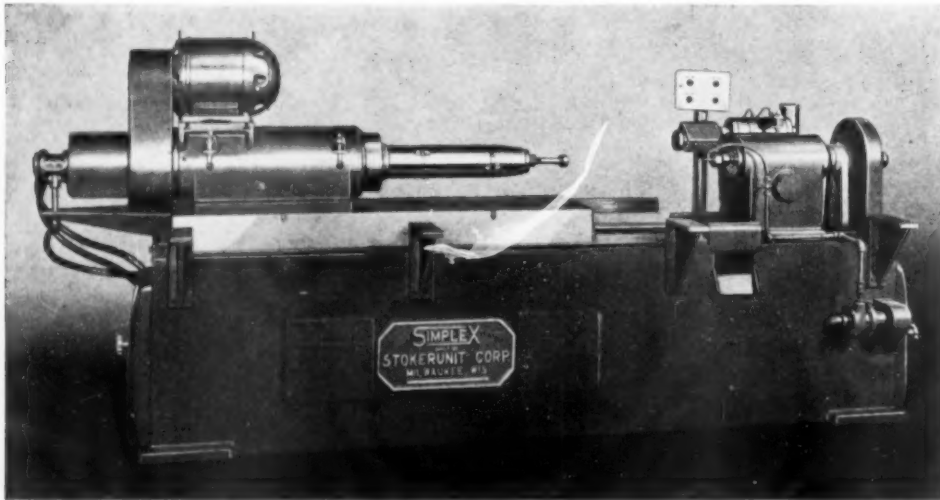
# *For Speeding Up Shell Production*

## **Simplex Shell Nose Boring Machines**

...These modern, high production machines face, bore, and chamfer shell noses after the nosing operation and preparatory to threading. The operation is controlled by a fully automatic cycle and production is limited solely by the operator's ability to handle forgings. Production rates up to 100 pieces an hour depending on size (90mm. to 155mm.) and condition of shell body prior to boring have been attained.



**Simplex Shell Centering Machines** fit directly into the conveyor line that brings the forged shell bodies up to the lathes. The operator rolls the shell on to the work tray, presses the automatic cycle start button, and 30 seconds later rolls the shell back on to the conveyor. That's all.



NOTE: The operation is fully automatic; there is no lifting of the shell bodies; production speeds are much faster than with any machines hitherto used, the heavier the shell the greater the advantage. Shells of 155mm. or 6" (130-160 lbs. weight) and down are easily handled by unskilled help with very short instruction.

Simplex Shell Centering Machines are now available for 90, 105, and 155 mm. shells.

**BUILT BY**

# **STOKERUNIT CORPORATION**

**4558 W. MITCHELL STREET**

**MILWAUKEE, WISCONSIN**

# 2 NEW

## GRENBY GRINDERS



### THE GRENBY IG-10 INTERNAL GRINDER

- Ex-Cell-O 35,000 RPM Spindle
- Power or Hand Feed
- Four Speed Power Feed Unit
- Precision Motorized Workhead
- Table Travel 10"
- Cross Travel 4"
- Grinding Capacity  $\frac{1}{8}$ " to 3" Holes



### THE GRENBY EG-10 EXTERNAL GRINDER

- Precision Spindle
- Power or Hand Feed
- Swivel on Grinding Head
- Swivel on Work Head
- Grinding Capacity 8"
- Cross Travel 4"
- 8" x  $\frac{1}{2}$ " x 1 $\frac{1}{4}$ " wheel

SEND FOR THE GRENBY CATALOG

# GRENBY MANUFACTURING CO. PLAINVILLE, CONN.



## *Both sides of the story...*

have been accepted and are being answered today in your factory and our factory . . . . Let's work together in this Battle of Production to eliminate their side.

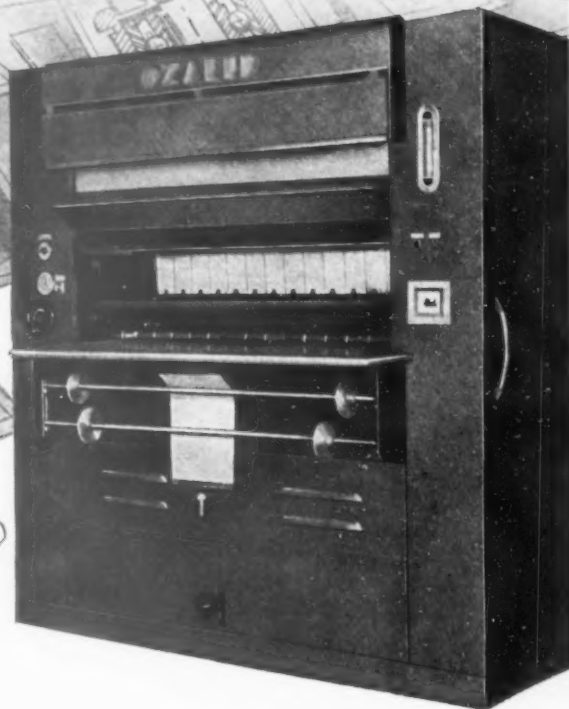
*A. R. Wheel*

EASTERN CUTTER SALVAGE CORPORATION, 30-32 LITTLETON AVE., NEWARK, N. J.

Western Plant MASTER TOOL CO., INC., 5605 HERMAN AVE., N. W. CLEVELAND, OHIO

Chrome Plant MASTER CHROME SERVICE, INC., 5709 HERMAN AVE., N. W. CLEVELAND, OHIO

# BETTER PRINTS FASTER WITH DRY DEVELOPMENT



## BASIC FACTS ABOUT PRINT MAKING YOU SHOULD KNOW

OZALID SENSITIZED MATERIALS ARE AVAILABLE IN CUT SHEETS AS WELL AS ROLL STOCK. Thus, when you have engineering drawings, maps or charts to be reproduced, you can eliminate trimming waste by using cut sheets of Ozalid material which correspond to the size of your tracings.

Ozalid cut sheets are conveyed through an Ozalid whiteprint machine the same as roll stock—without "leaders"—without the complex operations necessary with all wet development processes. By contrast, blue print material when cut from a roll must be processed by hand.

This is the fourth of a series of facts on modern printmaking. Watch for Fact No. 5.

**PRINTS DEVELOPED DRY** are permanent—true-to-scale of the original—made so quickly you're able to speed your entire production schedule!

The Ozalid Process of making positive-type whiteprints by dry developing sensitized materials in a whiteprint machine is simplified printmaking that will give you **better prints faster!**

Ozalid whiteprints are made in two fast operations—exposure and dry development. They are never moistened by solutions—never washed or fixed as in blue printing—never wrinkle—curl—or fade in sunlight.

Standard Ozalid sensitized materials develop blue, black, or maroon lines on a white background. Transparent papers, cloth or foils produce duplicate originals which are three to five times faster printing than Van Dykes when making subsequent prints.

Whether you need large—small—or medium print production, there's a specific Ozalid machine to meet your demands—to enable you to speed production. By dry developing your prints you save in time—labor—materials.

Write today for an illustrated folder describing the many advantages of printmaking with the Ozalid Process.

SPECIFY **Ozalid**  
WHITEPRINTS

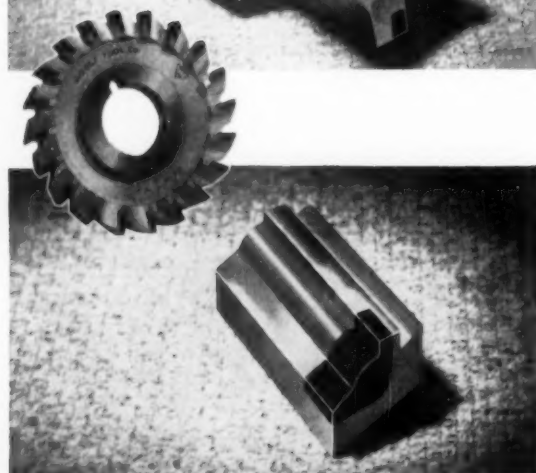
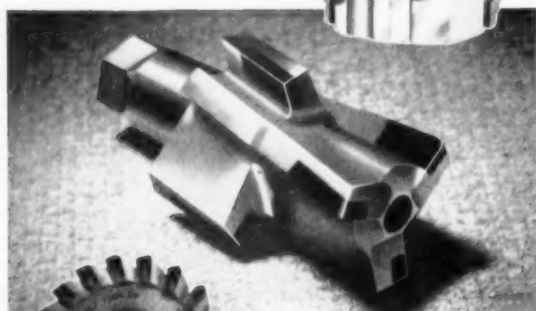
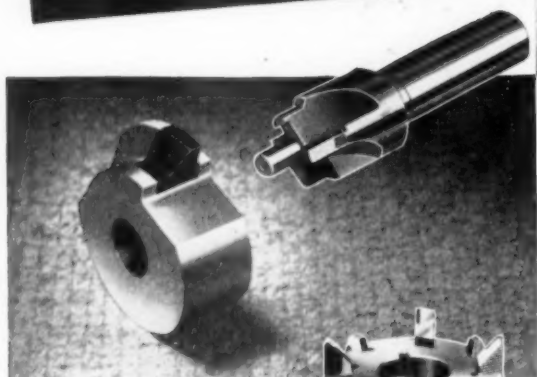
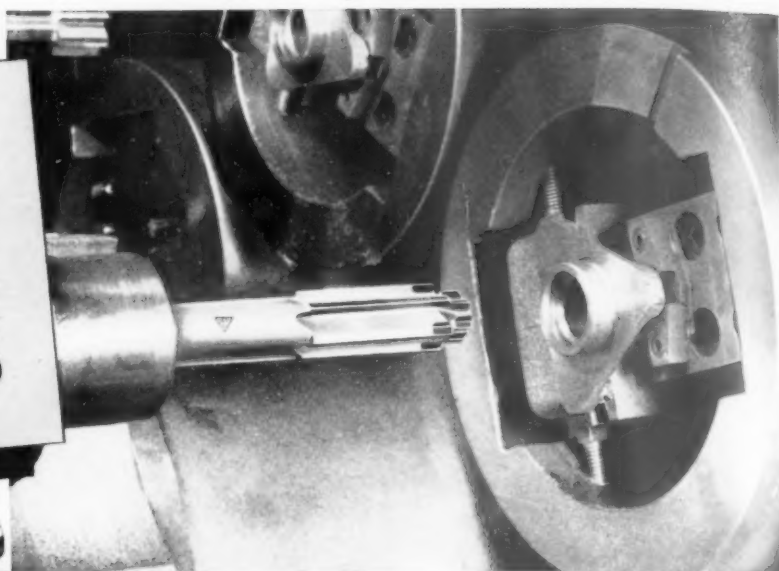
**OZALID PRODUCTS DIVISION**

GENERAL ANILINE & FILM CORPORATION

JOHNSON CITY, N.Y.

Ozalid in Canada • HUGHES OWEN CO. LTD., Montreal

# Special CEMENTED-CARBIDE TIPPED CUTTING TOOLS



## Produced *Exactly* to Your Specifications . . Delivered Promptly

The Morse Tool Company, over the past few years, has manufactured thousands of special cemented-carbide tipped cutting tools. Wherever they have been used, they have done their job extremely well. For that reason, the demand for them necessitated the expansion of facilities to manufacture tools of this type. A new and entirely separate division was formed under the name of Carbide Fabricators.

Today, Carbide Fabricators occupies a modern, spacious plant in which all equipment is devoted to cemented-carbide work . . . providing the means to turn out tools of exceptional accuracy and quality and to eliminate long delays in delivery. We will welcome the opportunity to tell you how we can meet your requirements during the present War Program. Your inquiries (accompanied by blueprints) will receive prompt attention.

We are authorized suppliers of Carboloy, Firthite and Vascoloy-Ramet cemented-carbides.

## And a Complete Line of Standard Tools

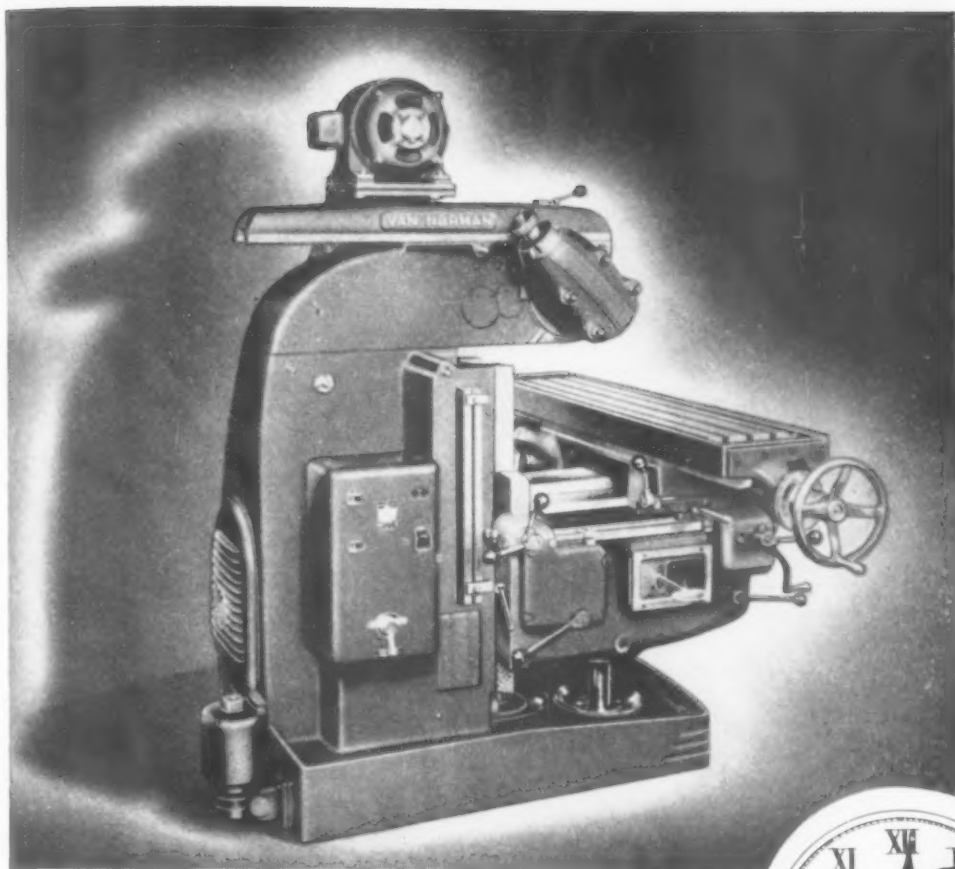
Carbide Fabricators stock a complete line of standard cemented-carbide tools. Pricing is simplified so that the same low unit cost prevails for tools ordered in any quantity. WRITE FOR OUR NEW CATALOG.



# Carbide Fabricators

BERKLEY  
MICHIGAN

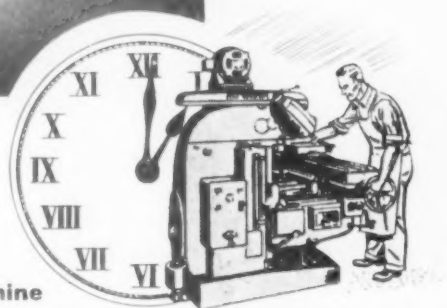
DIVISION OF MORSE TOOL COMPANY . DETROIT



## MORE WORK PER MAN-HOUR . . .

As one authority puts it: "You don't buy a machine tool so much as you buy results — the greatest number of pieces per hour, produced with highest accuracy." And this is exactly what you get in every one of the five models of Van Norman Ram Type Millers. Your operators can turn out more and better work because they have so much less preliminary, error-charged, fussing to do . . . because it is so much easier to set up these machines . . . and to control them when they are in operation. Set-up time is saved by combining the adjustments of cutterhead and ram to take successive cuts from horizontal to vertical.

Control is simplified by grouping the levers, governing direction of power feeds and of 6-way rapid traverse, right at operator's fingertips on both sides of the machine . . . and by giving him large dials for easy, accurate reading. And accuracy is underwritten by Van Norman's 50-year tradition of high-precision manufacturing . . . by full measure of quality in every mechanical feature, including ample weight and rigidity for smooth operation on heavy cuts. That's why . . . when you buy a Van Norman Universal . . . you buy results.



### No. 26 & No. 36

RAM TYPE UNIVERSAL

Table: 50" x 12"

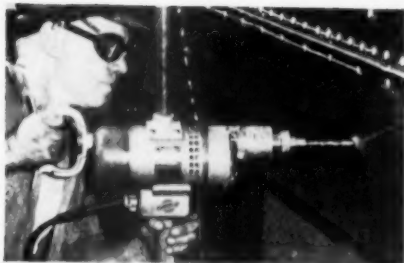
Range: 28" longitudinal,

12" cross, 18" vertical

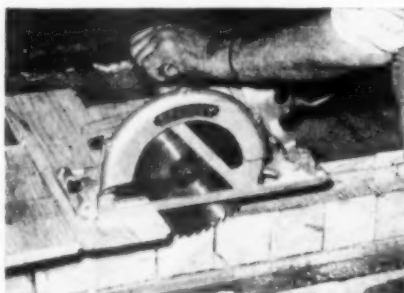
(No. 36 Table: 58" x 13")

**Van Norman Machine Tool Co., Springfield, Mass.**

**THERE'S SOUND  
"TOOL SENSE"  
BEHIND  
"STANLEY"**



**STANLEY ELECTRIC DRILLS** pack the power for double duty — as a portable drill, or as a drill press — when mounted in a Stanley Bench Stand. Fourteen models — capacities from  $\frac{1}{4}$ " to  $\frac{7}{8}$ " in steel.



**STANLEY SAFETY SAWS** are powerful, well balanced tools. Safety guard keeps cutting edge covered at all times. Base tilts  $45^\circ$  for bevel cuts. Simple depth adjustment. W-9 shown has cutting capacity of  $3\frac{1}{4}$ ".

★ ★ ★


### **DOING OUR BEST!**

The widespread demand for Stanley Electric Tools in war production work means that we may not be able to supply you as soon as we would like to.

We have more than doubled our production of a year ago. We're doing our best . . . but priority business must be taken care of *first*.

Ninety years of "Stanley Tool Sense" demand your attention and consideration when comparing tool values. It was not easily acquired . . . but it's an important reason why Stanley Electric Tools stand up better on the toughest jobs, and help deliver more finished work per day.

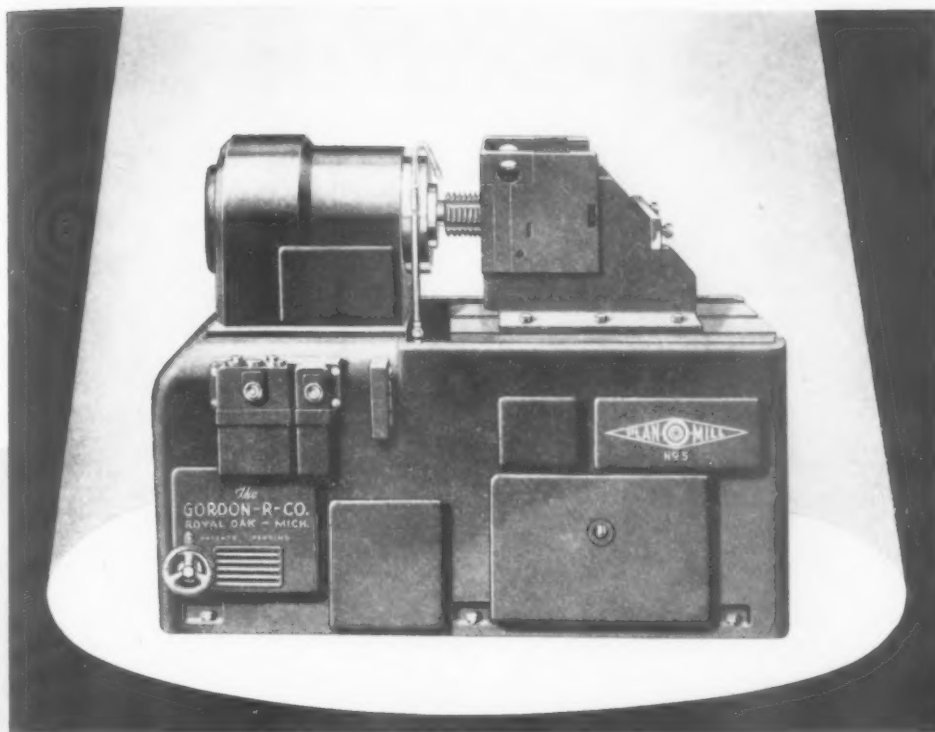
The No. 72—7" (or No. 92—9") Grinder and Sander is a good illustration of the way Stanley Electric Tools are planned for the job. Plenty of power for the toughest production and repair work, yet its compact design and handy "balance" permit operation 'round-the-clock without fatigue. Use it with abrasive discs or wheels for a hundred different jobs — such as smoothing castings or heavy welds, removing rust and paint, scouring and cleaning vats.

A typical example of how all Stanley Electric Tools are designed for *industrial* use and are built to give service. Stanley Electric Tool Division, The Stanley Works,  New Britain, Connecticut.

# **STANLEY**

## **ELECTRIC TOOLS**

★★★ A Complete Line for Industry ★★★



## *Announcing* NEW, IMPROVED HYDRAULIC PLAN-O-MILL FOR AUTOMATIC THREAD- AND FORM-MILLING

● In this larger, heavier PLAN-O-MILL all the recognized advantages of planetary milling have been retained and exceptional flexibility has been added. To perform any specific job, cutting speed, rate and depth of feed can easily be adjusted by the simple twist of a dial. Once set up future operations are automatic.

Fixtures designed by Gordon-R engineers permit a wide range of applications. Breech blocks, breech rings, cylinder heads, propeller hubs and blades, and gun barrels are among the many vital military parts speedily and economically machined. Worry-free precision meets tolerances easily.

By combining in one machine the exceptional accuracy of planetary milling with the flexibility of hydraulic operation, *hydraulic* PLAN-O-MILL offers arms manufacturers five important economies: (1) relatively low cost, (2) economy of weight, (3) economy of floor space, (4) more economical use of manpower, (5) greater production economy.

Specifications and operating procedure, together with full explanation how Gordon-R production engineers can serve you, will be rushed upon receipt of letter, wire, or telephone message.

**DO YOU KNOW—**  
how plan-o-milling—the modern method of thread- and form-milling—can give you more perfect parts at lower cost per part? The **BIG** story of plan-o-milling—what it does and how it does it—is clearly and simply told in a few words in “Just Push the Button”. Send for your free copy.



# *The* GORDON-R CO.

625 WASHINGTON  
SQUARE BUILDING

*Manufacturers of*



ROYAL OAK,  
MICHIGAN

# Get more machine tools in your present space

as for instance

**VERTICAL  
THREAD  
GRINDERS**



**SAVE  
THIS  
SPACE**

Machine is 39 inches deep, 43 inches wide, and 72 inches high, with extreme operating floor space 39 inches by 48 inches. Shipping weight is approximately 3200 lbs.

With

## DALZENS

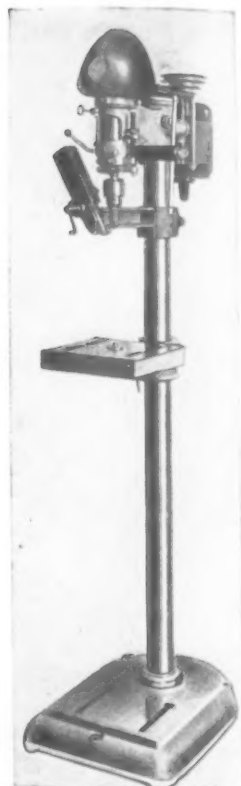
**They do much more  
and need less floor**

With the present tremendous plant expansion programs underway, the item of machine space becomes ever more important. Plant and Tool Engineers are burning "the midnight oil" trying to work the required amount of machine tools into a given amount of floor space.

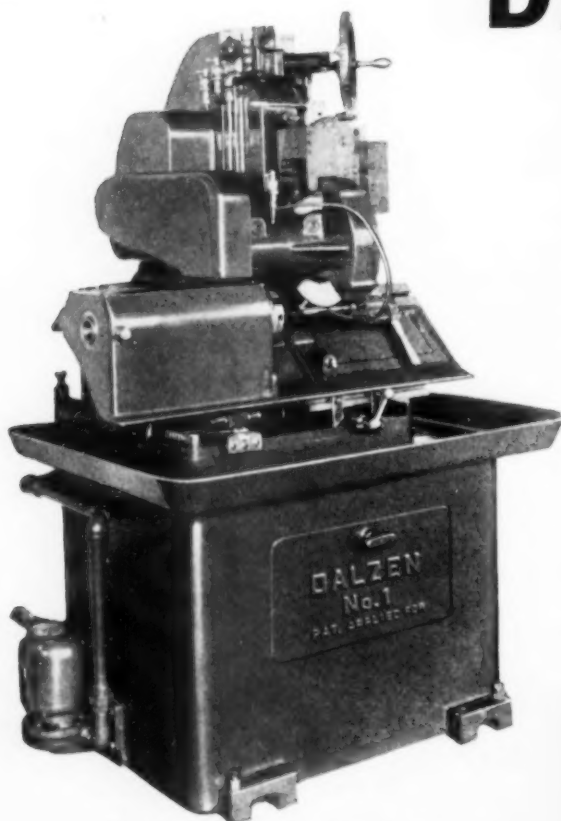
This is where the Dalzen line of Vertical Thread Grinders plays an important role—accuracy and production combined in a machine tool requiring little more than half the space formerly required for the production of ground threads.

These machines are furnished in two sizes. No. 1 Dalzen which will grind up to 6 inches diameter, 10 inch length threads anywhere on an 18-inch shaft. Dalzen No. 2 will grind a 3-inch diameter, 4 inches in length anywhere on an 8-inch shaft.

We also manufacture the Dalzen Combination Center Lapping Machine and Drill Press which saves the floor space formerly required for two separate machines.



Can be changed over in a moment from Center Grinder to Drill Press or vice versa. You simply loosen one bolt and adjust the Center Grinder dresser in or out of position.



This machine is 38 inches deep, 48 inches wide, and 75 inches high. Extreme operating floor space is 38 inches by 60 inches. Approximate shipping weight, 4400 lbs.

## DALZEN TOOL & MFG. CO.

12255 E. 8 Mile Road

Detroit, Mich.

# Hard Chrome Plating SAVES YOUR GAGES



Today, extra gage life has become of vital importance. Chrome plating, as it is employed at Lincoln Park, gives you greatly increased wear-resistance in new gages . . . provides the means to salvage your worn ones.

Lincoln Park's salvaging processes, especially, offer a solution to your present-day gage needs. The steel gages—or non-cutting precision tools—which you would ordinarily discard can be sent to us. Handled entirely in our own plant, they are carefully prepared for plating, are hard chrome plated, and then finished. The work is always completed promptly and at nominal cost to you. When returned to you, the gages are exactly to the specified tolerances, and can be depended upon for use far exceeding the original period of service.

## THREAD PLUG GAGES, TOO, CAN BE SALVAGED


One of the most important services now offered by Lincoln Park is the salvaging of thread plug gages. In this process, threads of American National forms worn as much as .003" are ground, plated and reground to Class X, Y or Z tolerances. They are restored to original size or any other size which may be specified provided it is within the salvaging limits. Complete information concerning this work will be sent you immediately upon request.



# LINCOLN PARK TOOL and GAGE CO.

LINCOLN PARK, MICHIGAN

# MASTERS of PRECISION



CLEEREMAN Jig Borers and the men who build them are masters of precision. Design, selection of materials, fabrication, assembly, inspections, and tests are all performed with one purpose in mind—to build precision machines that will turn out precision work at low cost for many years after purchase.

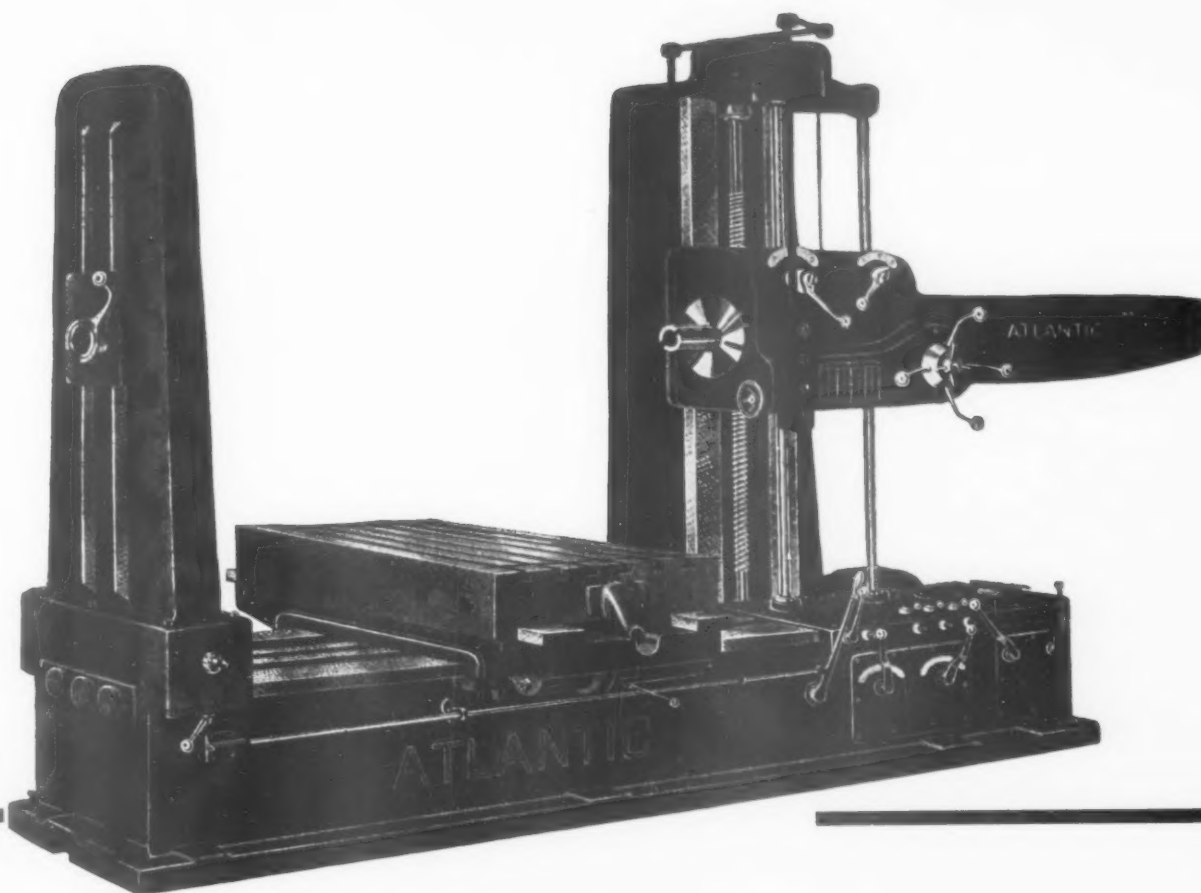
Users know that CLEEREMAN men and CLEEREMAN Jig Borers are masters of precision.

Jim Le Clair—master craftsman—testing the precision of a CLEEREMAN Jig Borer spindle.

**Bryant Machinery & Engineering Company**  
Sales Division: **Cleereman Machine Tool Co.**  
400 W. Madison St. • Chicago, Ill., U. S. A.

## CLEEREMAN

**DRILLING MACHINES and JIG BORERS**



4"—5" SPINDLE  
HEAVY DUTY—PRECISION TYPE

## HORIZONTAL BORING MACHINES

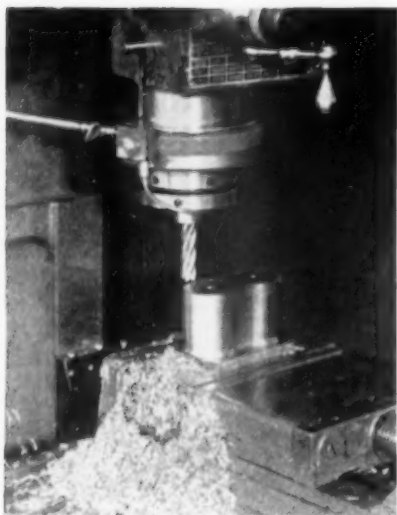
Designed for Accurate  
Work on Armor Plate,  
Armor Steel Castings  
and Similar Materials . . .

*Reasonably Prompt Deliveries*

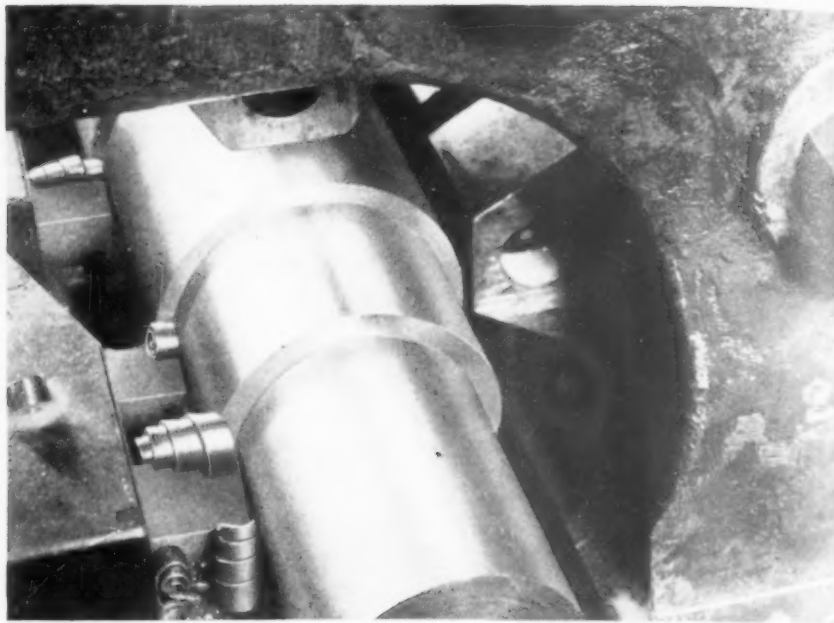
**ATLANTIC MACHINERY CORPORATION**

149 BROADWAY

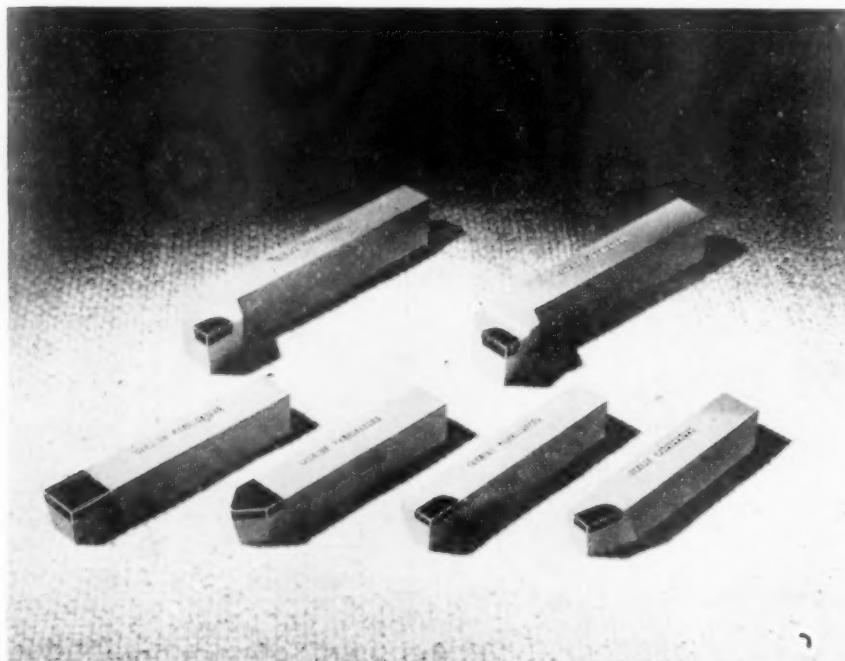
NEW YORK, N. Y.



Above is shown the finish milling of a blanking punch using a Putnam Hi-Speed End Mill. Jobs such as this require long life at high speed and this is an operation involving precision movements and a Rotary Head motion. The End Mill shown is manufactured by The Putnam Tool Company, Detroit, Michigan.



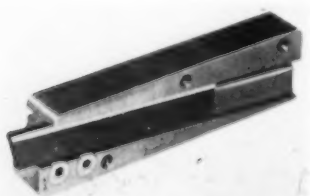
Typical of the high speed prevalent in war time mass production is the Cutting Tool set-up shown above. The picture shows four grooves,  $\frac{3}{4}$  inches wide, being turned in a cast iron sheave with Haynes Stellite tools at a surface speed of 73 feet per minute and a feed of 0.006 inches per revolution.



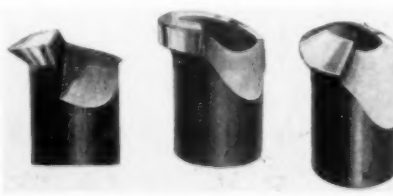
Practically all cemented-carbide tool manufacturers have adopted standardized forms or blanks similar to those shown in the above illustration which were manufactured by The Carbide Fabricators, Division of Morse Tool Company in Berkley, Michigan. Practically all manufacturers make a complete range of styles and sizes, their lines meeting almost every need for turning, boring, and facing work. Companies such as Firth-Sterling Steel Co., Vascoloy-Ramet Co., Carboloy Co., Super Tool Co., and others are producing these tools in large volume and, therefore, carry stocks the pricing of which has been simplified so that the lowest possible unit cost prevails for tools purchased in any quantity. These stock tools, ground ready for use and immediately available, are directly applicable to probably 85% of all normal machining applications.



Above is shown the B & B Spotfacer and Boring Tool with Micrometer adjustment on head which enables the operator to set and lock blade to precise diameter measurements within .0001. Head adapts itself to boring in either forward or inverted direction.



Above is shown a new development in a Cutting-Off Blade—the Luers Patented Cutting-Off Blade in a new holder for the New Britain-Gridley automatic screw machine. This new tool is manufactured by the Empire Tool Co., Detroit, Mich.

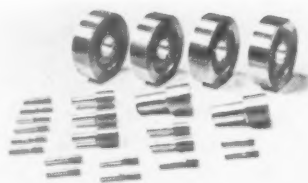


Precision Boring Tools. At the left is shown Bokum Tool Company's Boring Tool for internal threading. In the center is their Style B for facing and bottoming blind holes, and to the right their Style A for general boring purposes.

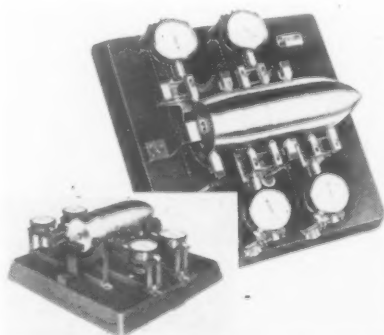


The Boring and Reaming Tool, shown above, is a new development introduced by the State Manufacturing & Construction Co. of Franklin, Ohio. The tool has multiple cutters that are fully adjustable. Cutting on all four bits in front and reaming on the sides, the bar will do heavy boring operations with utmost accuracy, it is claimed, and will also leave a high quality finish to the size desired.

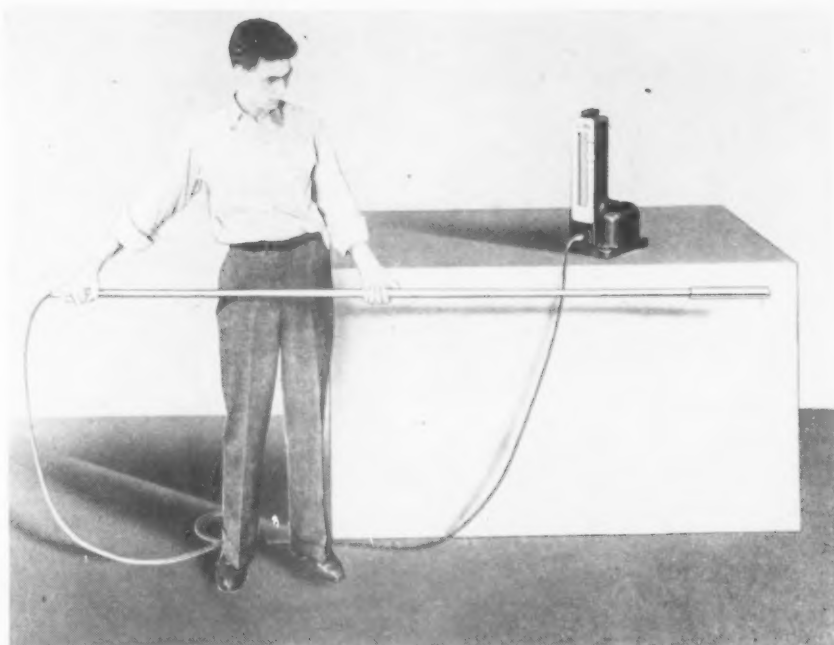
Emblematic of ultra-precision manufacture are Precision Gage Blocks—accurate to the millionth part of an inch. "Jo Blocks" have long been familiar to Tool Engineers. These are manufactured by the Johansson Gage Division of The Ford Motor Co. of Detroit. Manufacturers of other precision gage blocks, in various assortments of sizes and combinations, all of ultra-precision, are the George Scherr Co., Inc., New York City, Pratt & Whitney Div., Niles-Hement-Pond Co., West Hartford, Conn., and a new entry into the field, The Jansson Gage Co. of Farmington, Mich.



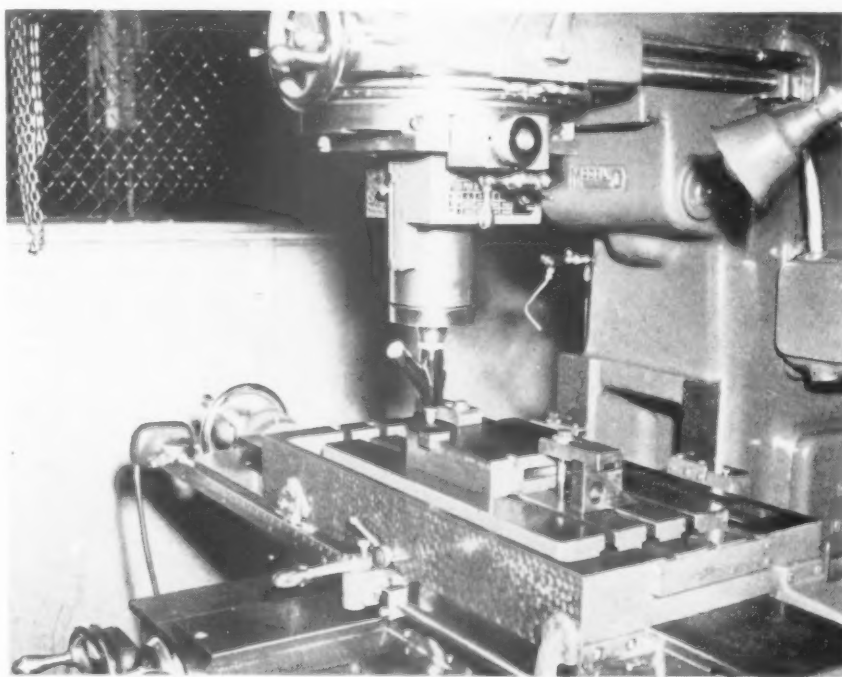
Above is shown a group of thread plug gages which have been salvaged by hard chrome plating. These gages were prepared, plated and reground to size by Lincoln Park Tool and Gage Co. In addition to salvaging thread gages Lincoln Park salvages ring and plug gages and manufactures new steel and chrome plated plug and ring gages. For extreme precision work and extraordinarily long life, plug, ring and thread gages are also ground from Carboloy—typical of several gage manufacturers.



Federal Products Corp., 1144 Eddy St., Providence, R. I., are the manufacturers of the Shell Diameter Gage. This gage is designed to check four diameters independently of each other. The effect is the same as if four operators checked these four diameters with four individual single purpose gages. This instrument can also be built so that more or fewer diameters can be checked if desired. The shell or projectile is located on the "V" block. Points at which the projectile contacts the "V" block are faced with tungsten-carbide to prevent wear. The end view in the photograph above shows the independent mounting of each indicator unit; only one unit is shown in this view. Other manufacturers of similar equipment are B. C. Ames Co., Waltham, Mass., Standard Gage Co., Poughkeepsie, N. Y., and The Comtor Co., Waltham, Mass.



Current activity in the production of small arms and artillery has focused considerable attention on the problem of the precise checking of gun bore diameters. Heretofore gun barrel checking has required a very high degree of skill on the part of the operators in order to obtain acceptable standards of precision. The pressure type gage, shown above, is manufactured by The Sheffield Gage Corp. and is known as the "Precisionaire." This instrument checks the diameter of bores of any length and any caliber, also the diameter of the rifling grooves in the gun barrel. It is manufactured in two models, A and B. The Precisionaire consists of a recording instrument incorporating a transparent indicator tube and a gaging nose. Compressed air from the regular plant supply is the actuating medium. An indicator float is free to move vertically inside the indicator tube in response to the velocity of air flowing around it. A graduated scale adjacent to the indicator tube facilitates easy reading of the indicator float's position.



Above is shown Kearney & Trecker's Center Scope—an optical instrument which is used for accurately locating work in line with a machine tool spindle. The Company distributes the Center Scope to be used on Milwaukee milling machines.

## SMALL TOOLS



The Profilometer, shown in the illustration to the left, is an extremely accurate electrical measuring device which will measure almost any degree of surface roughness on a wide range of surface sizes and shapes. The photograph shows the Profilometer being used to measure surface roughness on an aircraft engine cylinder bore. The instrument reads directly in true inch units and no calculations or scaling methods are necessary. The Profilometer is manufactured by Physicists Re-

search Company, Ann Arbor, Michigan.

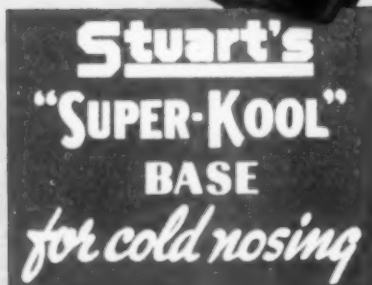
Newest product of The Vinco Corporation, Detroit, Michigan, is the Vinco Optical Inspection Master Dividing Head, which is used for the final inspection and checking of angular location



and spacing of splines, gear teeth and similar parts. When used in connection with the Vinco Cam Comparator the amount of rise and fall on automotive and aviation camshafts is easily and accurately checked. In addition, Vinco manufactures other precision instruments and many types of gages.

Most recent addition to the "Gusher" line of Coolant Pumps, manufactured by the Ruthman Machinery Company, Cincinnati, Ohio, is Model P3. This

## CUTTING OIL SERVICE THAT COUNTS



THE specialized cutting oil experience developed at pioneer war products plants provides a valuable working tool, immediately available to new government contractors.



For All Cutting Fluid Problems  
**D. A. STUART OIL CO.**  
Chicago, U.S.A. • LIMITED • Est. 1865  
Warehouses in All Principal Metal Working Centers



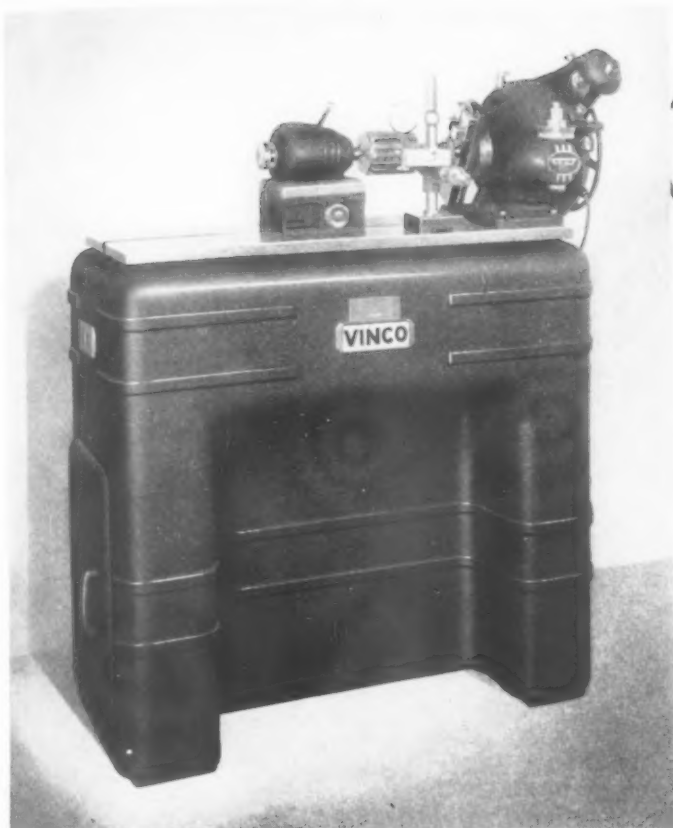
Ruthman

Model P3

model is made for the small machine tool and is available in four application types, with 1/30 or 1/10 H.P. driving motor. It is capable of pumping soluble coolants, and also cutting oils of various viscosities. This pump has a built-in ball bearing motor with a one piece vertical shaft and a pump in which there are no metal-to-metal contacts.

The Tomkins-Johnson Company, Jackson, Michigan, are the manufacturers of the "Brownie" Coolant Pump shown below. These pumps deliver a full flow of coolant at what is said to be a remarkably low horse power input.

THE TOOL ENGINEER



Above: VINCO OPTICAL MASTER INSPECTION DIVIDING HEAD—An instrument of extreme accuracy used for the final inspection of spacing, angular location or similar characteristics of gear teeth, master index plates, splines, etc. The Dividing Head, in conjunction with the Vinco Cam Comparator, can be used for checking the angular relation and amount of rise and fall of cams on automotive or aviation camshafts or on aviation cam discs. Camshafts up to 54" can be checked.

Right: VINCO GAGES AND PRECISION TOOLS—Illustrated here is a representative selection of the gages and precision tools manufactured by Vinco. Of special importance at the present time are many small arm projectile gages, a typical group being pictured. In addition, other types of inspection equipment such as alignment gages, fixture gages, etc. are produced regularly.

Left: VINCO ANGLE TANGENT TO RADIUS DRESSER—Meets every forming requirement in dressing radii, angles, and angles tangent to radii on abrasive wheels. All operations are performed from the same axis without the necessity of moving the diamond. Dressing accuracy is guaranteed to within .0001".



Full information on these and other Vinco products will be furnished gladly upon request.

# PRECISION MADE TO DO *Precision Jobs*

• Vinco products have become vitally important in today's production of precision parts. Before thousands of aircraft and other highly accurate parts reach final assembly, they have been checked with Vinco gages or Vinco inspection instruments. In some cases, only by the use of complicated and cumbersome equipment could the function of Vinco products be even partially duplicated. Illustrated are typical items in regular production in the Vinco plant.



## VINCO Corporation

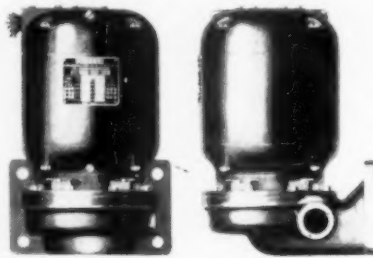
9115 SCHAEFER HIGHWAY DETROIT, MICHIGAN

## SMALL TOOLS

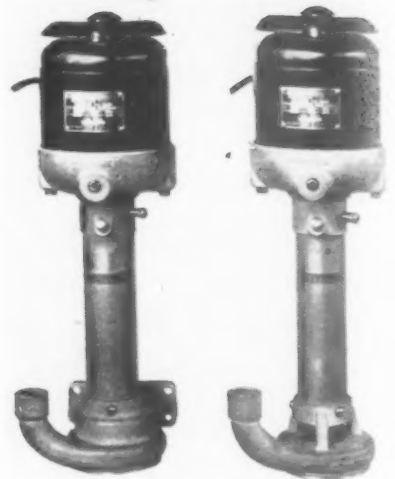
Features claimed for these pumps are: no packings to leak, no screens to clog, ball bearing within one inch of the impeller 976 G.P.M.

Right, is shown Pioneer Model VBA Coolant Pump, designed for operation in low fluid levels. Manufactured by the Pioneer Engineering and Mfg. Co., 19645 John R. St., Detroit, Michigan.

The V Block milling fixture is a simplified holding device for odd shaped pieces which would normally take a complicated setup for milling, boring,



Pioneer Model VBA  
For low-level fluids.



Tomkins-Johnson  
"Brownie" coolant pump.



**Here is YOUR weapon  
to help win this war!**

**You can produce munitions stampings  
with the Dieing Machine COMPLETE  
PER STROKE at new high rates.**

At rates never before approached, Dieing Machines are turning out COMPLETE PER STROKE intricate munitions stampings of many types, including machine gun belt links, cartridge clips, mechanical time fuse stampings, bomb parts, shell parts, rifle components, airplane parts, etc. Precision of stamped product is readily maintained within .0002" limits when required. Capacities: 10 tons to 300 tons, producing 1 to 20 completed parts per stroke at speeds up to 600 s.p.m.

Request Catalog 42

**THE HENRY & WRIGHT MFG. CO.** 482 WINDSOR ST. HARTFORD, CONN.

**HENRY & WRIGHT  
DIEING MACHINES**



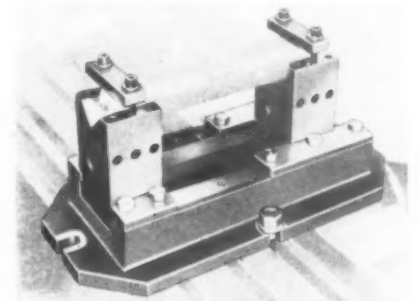
Belt link for Vickers  
type machine gun  
produced complete  
one per stroke, 140  
per minute.



Cartridge clip for  
caliber .303 rifle pro-  
duced complete one  
per stroke, 120 per  
minute.

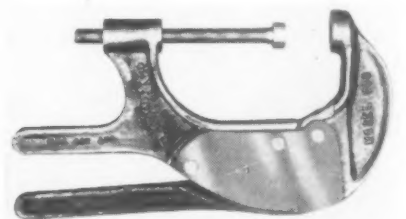


Airplane strut seat of  
.031" brass produced  
complete per stroke  
from flat material,  
140 per minute.



Hartford's V Block  
Milling Fixture

an overall width of 9 1/4", an overall height to the top of the V-blocks of 7 5/8". The maximum arbor diameter that can be held in the V-blocks is 2 1/2". This is a new product of The Hartford Special Machinery Co., Hartford, Conn.



Above is shown a new adaptation of the Toggle-Action type of clamping device and is known as the Klampacto Toggle-Action "C" Clamp. This tool is said to speed production where the same thicknesses must be clamped and released in quick succession. It is manufactured by Knu-Vise, Inc., 16841 Hamilton Ave., Detroit, Michigan.

**THE TOOL ENGINEER**



## DoAll BAND SAWS

### SING THROUGH ANY METAL

With a speed and sureness that is amazing, these wonder saws cut right through any kind of metal or alloy up to 10" thick (and even thicker). These band saws offer you today's fastest machining method of external and internal removal of metal.

Above view (Parten Mfg. Co., Minneapolis) shows Beaters for Pulverizing Machines made on the DoAll. Formerly, these were drop forged.



Various parts used in maintenance work at St. Paul Vocational School, now made on the DoAll at a 33 1/3% saving.

### 42 OPM SIZES

DoAll Band Saws come in hundred-foot coils, each in a metal box with opening for saw to be pulled out and cut off as needed. Each box is plainly marked with size and style of saw.



Pat. No. 2,255,577  
Design Pat. No. 127,313  
Other Patents Pending

### FREE

If you haven't seen the booklet "Actual Performance Records of DoAll Saws", send for copy today. It's interesting.



## THE DOALL COMPANY

1211 THACKER ST. DES PLAINES, ILL.  
Associated with Continental Machines, Inc.  
Minneapolis, Minn.

MARCH, 1942

# EMPIRE TOOL COMPANY'S

LUERS  
PATENTED

## CUTTING-OFF BLADES

## Join New Britain Automatics

*in answering America's Call for*

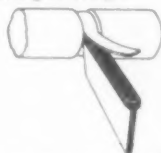
# UNINTERRUPTED SPEED

**Luers Patented Cutting-Off Blades tried on toughest jobs... they "came through"... now accepted by New Britain-Gridley Machine Division**

In line with its purpose to give users the highest efficiency in cutting tools, New Britain has adopted the Luers Cutting-Off Blades.

As a result of most trying tests—on some of the toughest jobs to which cutting blades could be put—these blades showed most remarkable performances.

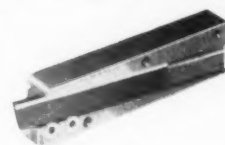
In addition to speeding up the cutting operations, these blades showed less breakage loss and less time-out for sharpening.



Because the top of the blade is hollow-ground, the chip, in leaving the cut, assumes a concave shape. In this form it does not rub against the sidewalls to generate heat and cause breakage.

The side clearance provided through the specially designed "T" shape removes the cause of friction. Not only is breakage reduced but the necessity for grinding is eliminated.

Produced under license issued by  
John Milton Luers Patents, Inc.



### Blade Holders available for all leading machines

The holder pictured above is used on the New Britain-Automatic. The blade is held as rigidly as a forged tool.

The unusually narrow cut made possible by the unique design of the blade tends to conserve stock. Obviously, the narrower slot wastes less material in the cutting operation.

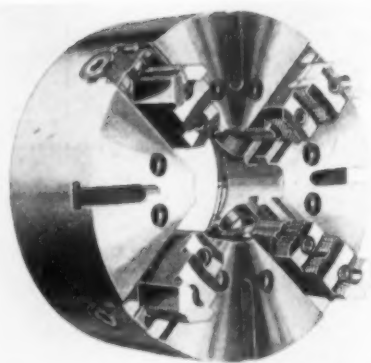
A further saving is achieved through a user's ability to benefit from the entire length of the blade down to the last inch which must remain in the holder.

Luers Holders have been specially designed for all leading machines.

The Blades that  
reduce friction

**EMPIRE** Tool Co.

8776 Grinnell Ave.  
Detroit, Mich.



Nearly every type of ordnance and war materiel from airplane propeller hubs and aircraft motors to guns, shells, mobile equipment and instruments, are fashioned in the jaws of some chuck. The procedure of holding work in the jaws of a chuck enters at one stage or another into the production of practically all products machined from metal. A typical chuck is shown in the photograph, left. It is a Cushman, heavy duty, four jaw, independent model. Manufacturers of Precision Chucks typical of this class are The Cushman

Chuck Co., Hartford, Conn., Westcott Chuck Company, Oneida, N. Y.

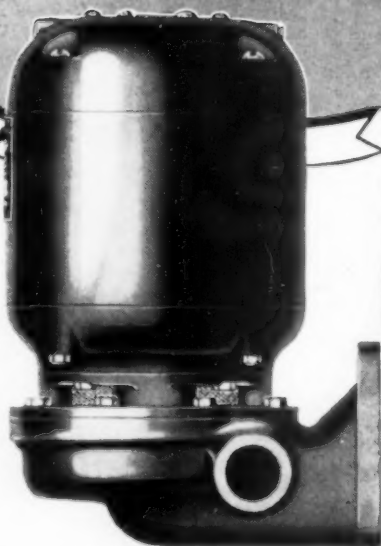


**Production too vital—  
Metals too essential—  
to risk the waste of both, because  
of faulty lubrication or cooling.**

**You Can Depend Upon  
PIONEER PUMPS**

Pioneer Pump Model VBA—one of the newest developments—compact—streamlined—designed to operate with low water level out of reach of other pumps.

This is one of the 350 Pioneer Models. There is a size and type to meet your particular lubricant or coolant requirement.



**PIONEER ENGINEERING & MANUFACTURING CO.**

19645 JOHN R STREET • DETROIT, MICHIGAN

Studebaker Machine Company, Chicago, Illinois, has introduced an hydraulic visepress, said to offer considerable savings in time and labor. Capable of developing pressures up to 5 tons between the jaws, the new visepress is designed to speed up small press and cutting operations, as well as ordinary vise work, and is understood to have wide application on production lines, in tool rooms and for maintenance. This new hydraulic visepress is operated entirely by foot control as shown in the illustration above, permitting the use of both hands in setting up and removing work. The unit is self-sufficient—no outside power is needed. Some of the types of work this new hydraulic visepress can perform are: press work, punching, bending, cutting, straightening, testing, and stamping. The visepress mounts horizontally on any type of bench as well as vertically on wall or post. In addition, it can be mounted on a portable stand as a movable, self-contained unit. Special jaw faces can also be applied. The features which are considered most important are the great saving in time and labor, the absence of a protruding handle, force being centered in jaws and not under them, and the accuracy of work due to the precision fit of the jaws.

The Cleveland Tool Engineering Co., Cleveland, Ohio, are manufacturers of the Universal Precision Indexing Head, shown below. This Indexing Head can be used on any tool or surface grinder, is graduated 360 degrees for every simple or compound angle and comes in standard index 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 or 60 spaces—or can be furnished for any index. A vernier lever will ro-

THE TOOL ENGINEER

**LUFKIN "MIKES"**  
... always dependable

DEPENDABLE  
HIGH QUALITY  
TOOLS



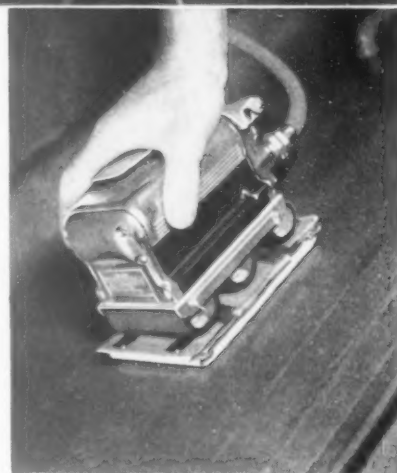
Because "quality first" has always been the rule with Lufkin, there is today no let-up in our efforts to supply you only the best Precision Tools that skill and experience can build. You can depend on that—and you can depend on the readings you take from your Lufkin "Mike." What's more, you can get those readings quickly and easily. For complete details see your dealer and write us for Catalog No. 7.

**LUFKIN**

SAGINAW, MICHIGAN • New York City  
TAPES • RULES • PRECISION TOOLS

MARCH, 1942

# BUY 3 SANDERS FOR THE PRICE OF ONE!



*In Metal Working:* Sterling Engineers are a concentration of fast, economical QUALITY metal finishing experiences — experience gathered in the finest plants across America. Ask to see a Sterling man!

Hand-sanding takes a lot of man-hours—and good hand-sanders are hard to find. But with "SANDY" you can turn almost any man into an expert—and he will do **3 TIMES THE WORK** of the former man!

"SANDY" is perfect for metal, wood or composition finishing; for wet sanding, feather-edging and clean-up—AND he works 3 times as fast even in the hands of an untrained man.

"SANDY"—THREE MEN IN ONE! GET PROOF BY ACTUAL DEMONSTRATION IN YOUR OWN SHOP!

"SHORTAGES" DEMAND THAT YOU ACT NOW!

## WRITE!

FREE — Send for "Hints on Sanding Savings" TODAY! Address Sterling Tool Products Co., 373 E. Ohio St., Chicago, Illinois. Don't delay! Write at once! Only a limited supply of this valuable leaflet remains.

*Sterling*  
TOOL PRODUCTS CO.

373 E. Ohio St. / Chicago, Ill.

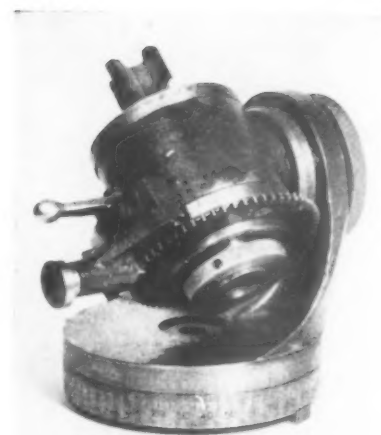


## SMALL TOOLS

tate work collet between index points without changing index or location of tool in collet. The collet quill is carried on aviation ball bearings to reduce friction for spirals. Standard equipment on this tool includes one standard Harding collet. Easily fitted with straight or taper shank or 3 jaw universal chuck.

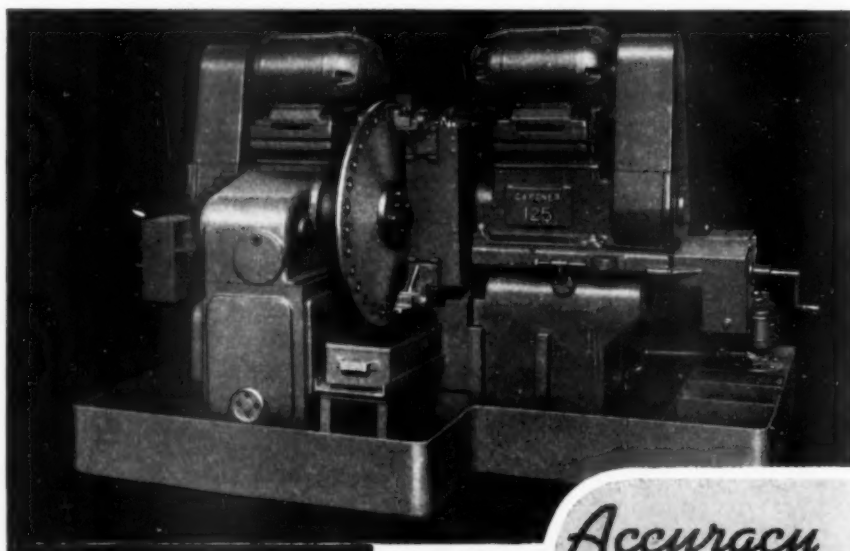
The Strippit Corporation, Buffalo, New York, has announced new compact models of the Wales Punch and Die Holders. These new models punch  $3/16$ " maximum holes on a minimum center to center distance of  $5/8$ " with

shut height of  $6\frac{1}{4}$ ". Each holder is a self-contained punch and die. "Selective Stripping" is an exclusive Wales development, it is claimed, and provides three instantly removable and interchangeable springs for a stripper selection of 1, 2, or 3 spring tension to custom fit the exact stripping action required by various gages and types of metals. Nothing is attached to the ram of the press in using this hole punching die and each individual unit may be reset or removed from the rail quickly. It is claimed that die setting time can

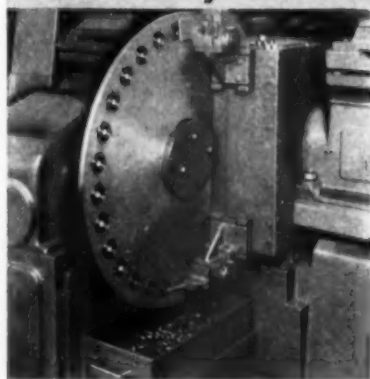


**Universal Indexing Head  
Made by Cleveland**

be cut from hours to minutes and presses kept in operation even when setting new patterns. Wales Hole Punching Hold-



*Accuracy  
that you've dreamed about!*



Investigate GARDNER  
PRECISION GRINDING—  
WRITE FOR DESCRIPTIVE BULLETINS!

GARDNER GRIND  
YOUR Flat SURFACES

**GARDNER MACHINE COMPANY**

442 East Gardner Street • • • Beloit, Wisconsin, U.S.A.

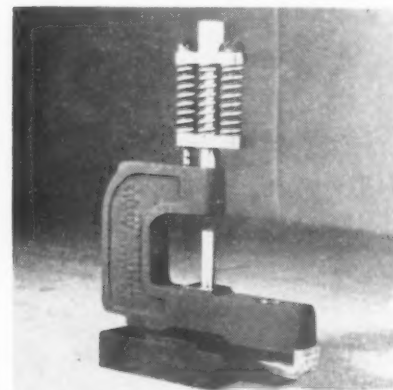
**THAT'S** the kind of accuracy YOU GET with Gardner PRECISION Double Spindle Grinders!

Look at the roller bearing rollers in the accompanying illustrations. They are ground on a No. 125-23" PRECISION machine, designed throughout with but one thought in mind—ACCURACY!

This tool has a capacity for rollers from  $3/8$ " diameter up to  $1\frac{1}{8}$ " diameter. They are loaded by hand into a rotary-type work carrier, and after passing between the abrasive wheels, are ejected by an automatic "kick-out". Two cuts are taken, the first removing approximately .006" overall stock, and the second, .002"-.003" overall.

These rollers are ground at 30 to 40 per minute, PER CUT, and are held within .0004" to .0005" for parallelism, and .0006" to .0008" for uniformity.

And THAT'S ACCURACY!



**Wales Punch, Die Holder**

ers. Dies and Punches are available in a wide range of standard and special sizes, capacities and models.

Macklin Company, Jackson, Michigan, manufacturers of grinding wheels, have made extensive additions to their manufacturing facilities—the most recent several months ago, a building to



house a new continuous kiln which will increase the production of vitrified wheels by 30% at the Jackson plant. The photograph above shows a view of the continuous kiln.

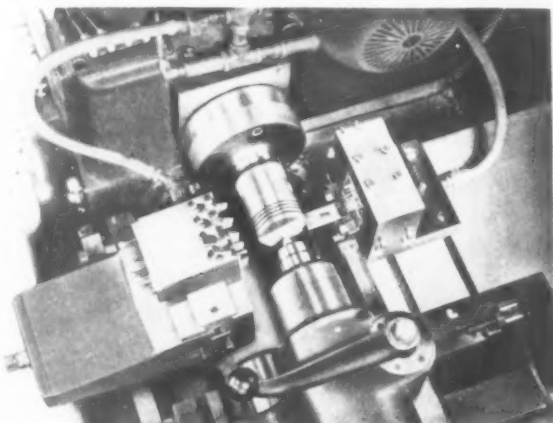
**THE TOOL ENGINEER**



**"THIS HYDRAULIC  
CIRCUIT GIVES  
POSITIVE FEEDS--  
NO TOOL  
JUMP"\***

\*This is what Gisholt Machine Company says about the JOHN S. BARNES hydraulic circuit installed in all of their No. 12 Automatic Lathes.

## **Gisholt Hydraulic Automatic Lathe Turns 180 Pistons Per Hour**



• Tooling set-up on Gisholt No. 12 Hydraulic Automatic Lathe. Finish turning and grooving is performed on 180 aluminum pistons per hour. Smooth hydraulic feed from a JOHN S. BARNES designed circuit assists in maintaining this production.

### **Feed in Inches per Revolution**

In this hydraulic circuit the feed pumps are driven from a gear on the spindle. Feeds stop when spindle stops — saves tools. Feeds are in inches per revolution — not inches per minute.

The traverse pump supplies oil at 35 lbs. per square inch pressure at the intake of the feed pumps. This insures a full and exact volume on each piston stroke.

### **Standard Units For Your Special Circuits.**

The complete hydraulic circuit for this Gisholt Machine has been designed to suit the specific functions of a production lathe. However, the pumps, valves and other basic hydraulic elements are from our standard line of time-tested units.

**YOU CAN BENEFIT IN TWO WAYS** — By consulting our engineers for a hydraulic application you can benefit through their experience with complex circuits for unusual machine cycles. You can be assured of the final success of your machine design, and its successful operation in production, through the use of standard Barnes units. Hundreds are in use in mass production equipment in all of our automotive industries. Maintenance costs are practically nil. For additional data write for the booklet offered below.

Some present users: Manufacturers of Machine Tools, Woodworking Machinery, Riveting Machinery, Printing Presses, Electrotape Shavers, Coal Mining Machinery, Valves.

**FREE New Data:** Included in this 40 page book are typical installation circuits, complete data covering piston and gear pumps and complete information covering basic elements of construction and installation of standard units used in these highly successful hydraulic circuits. Write for your copy today. Ask for Bulletin T. E. 342.



## **John S. Barnes Corporation**

DETROIT SALES OFFICE  
503 NEW CENTER BLDG.  
TR-1-1706

MAIN OFFICE  
AND FACTORY  
ROCKFORD, ILL.

MARCH, 1942

# **IT MAKES NEWS!**

**When a \$500 Fixture  
Displaces a \$6000 Machine**

**With GATCO**

**ROTARY JIG & PILOT BUSHINGS**

**in a fixture — this is  
not uncommon!**

**Investigate GATCO bushings,  
they may be of great help to you**



**DUST PROOF AS A WATCH**

**GATCO** for CARBIDE BORING  
DIAMOND BORING  
CORE DRILLING  
LINE REAMING  
HOLLOW MILLING  
TURRET TOOL PILOTING

## **GIERN & ANHOLTT TOOL CO.**

**1312 MT. ELLIOTT, DETROIT, MICHIGAN**

**BUILDERS OF DIAMOND & CARBIDE BORING  
EQUIPMENT**

HIGH SPEED TOOL CO., GALT, ONT., CANADA  
BANSBACH MACHINERY CO., CHICAGO, ILL.

ANY WAY YOU LOOK AT IT

## A TOOL MAKERS MACHINE TOOL!

### *Boyar-Schultz Profile Grinders*

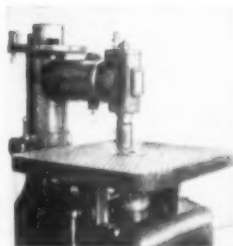
The new demand for Airplanes and Tanks in staggering numbers presents a real challenge to the American Tool Maker.

Rapid expansion of existing facilities for making this vital war equipment is aided by such "basic" machine tools as Boyar-Schultz Profile Grinders.

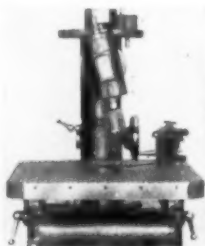
**BOYAR-SCHULTZ CORPORATION**

2116-C WALNUT ST.

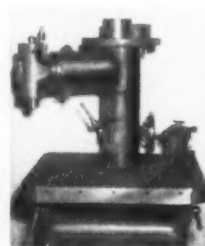
CHICAGO, ILLINOIS



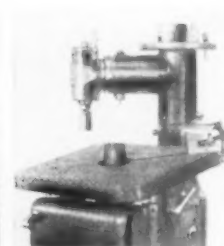
USING THE UPPER SPINDLE



UPPER SPINDLE TILTS TO 10°



USING THE LOWER SPINDLE



LOWER SPINDLE WITH TABLE TILTED TO 10°



## OK TOOLS, "Minute Men" of the Shop! ALWAYS READY FOR ACTION

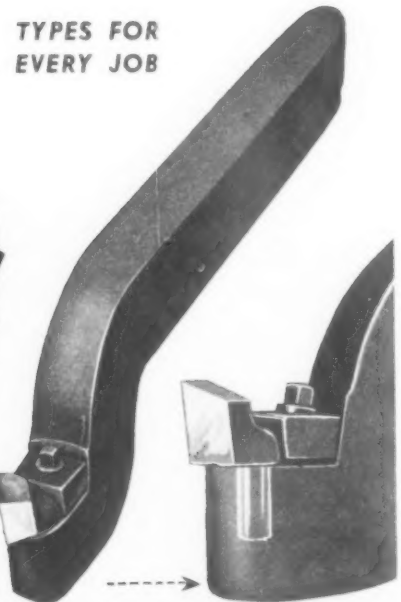
**B**ESIDES conserving high speed steel to the very limit, O K Tools do a faster, better job than the old solid tools. At relatively moderate cost, you can have bits on hand all formed, ground and ready for almost any job the ticket calls for. Such a wide variety of bits is available from our stocks that, for most operations, tooling up is the selection of the proper shape.

The locking designs of O K Single Point and Multiple Blade Cutting Tools are the result of years of study and shop use. They function readily, have no small screws, pins or wedges to lose, and hold with the tenacity of a solid tool! Reasonably prompt deliveries to plants engaged in Defense work.

**THE OK TOOL COMPANY  
SHELTON, CONN., U.S.A.**



Series 2000



Series O-200

TYPES FOR  
EVERY JOB



INSERTED-BLADE METAL CUTTING

# TOOL SYSTEM

# PRODUCTION SCREWDRIVING REQUIRES THESE MODERN MACHINES

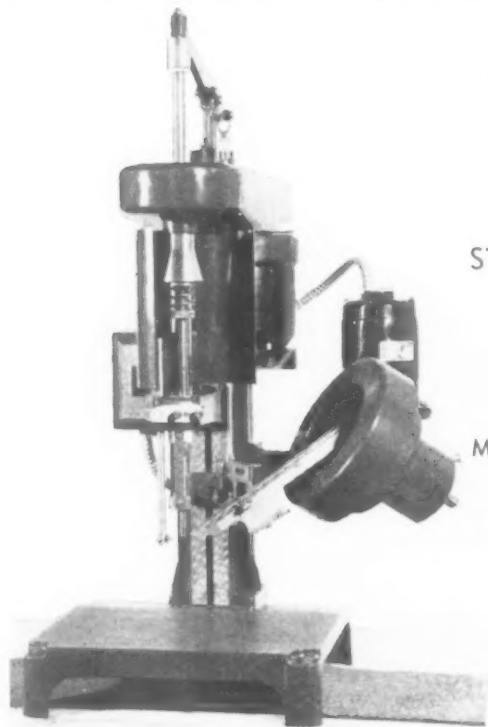
THREE MODELS  
TO MEET ALL REQUIREMENTS

SCREW SIZES  
FROM No. 2 to  $\frac{5}{8}$  DIAMETERS

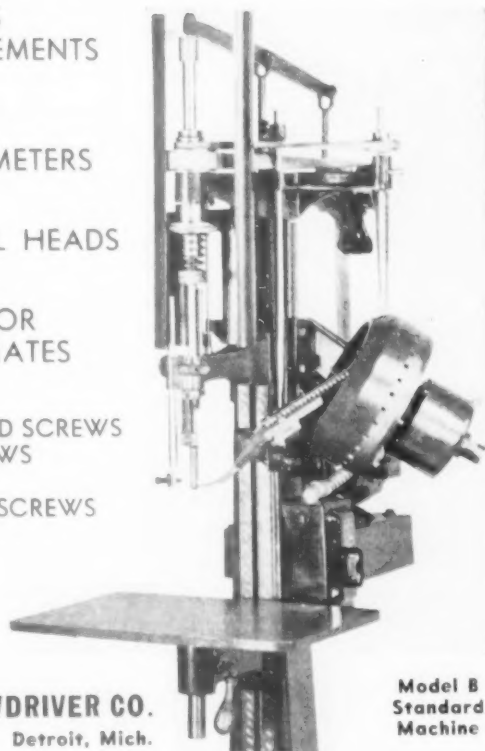
STANDARD OR SPECIAL HEADS

SEND SAMPLES FOR  
PRODUCTION ESTIMATES

MACHINE SCREWS — WOOD SCREWS  
SELF TAPPING SCREWS  
DRIVE SCREWS  
PARKER-KALON SPECIAL SCREWS  
Types A, U. & Z



MODEL A

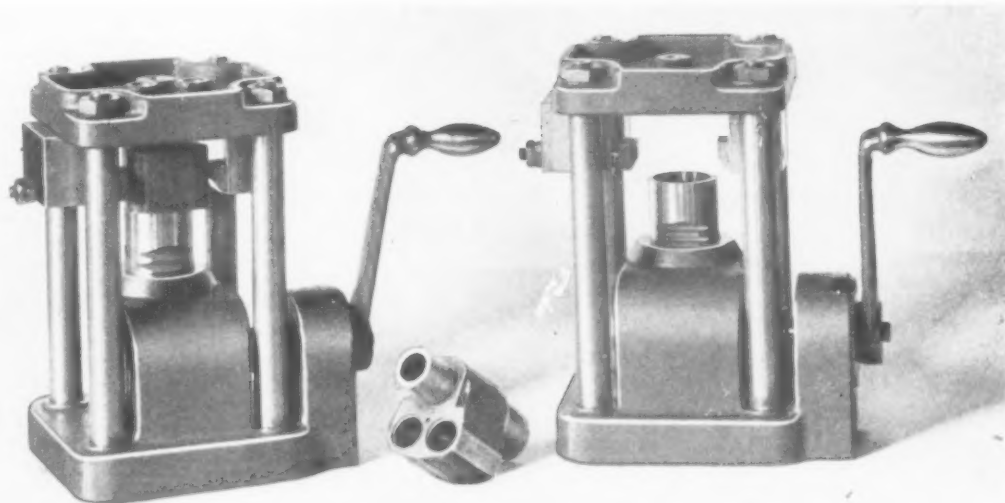


Model B  
Standard  
Machine

DETROIT POWER SCREWDRIVER CO.  
2805 W. Fort St. Detroit, Mich.

## *Fast! Accurate! Positive!* **SIEWEK DRILL JIGS**

Accurate  
drilling of  
this diesel  
engine part  
shown was  
accomplished  
through the  
use of the  
SIEWEK



Cut time in  
loading and  
unloading!  
SIEWEK  
DRILL JIGS  
are faster,  
more accu-  
rate, and  
give posi-  
tive re-  
sults!

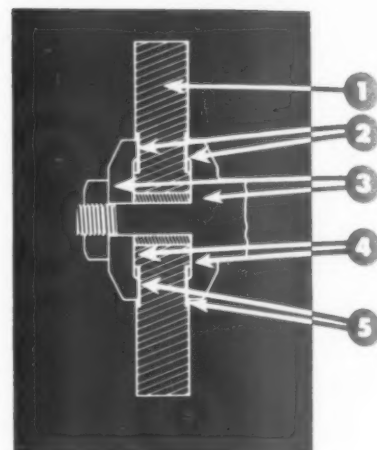
WRITE TODAY FOR DESCRIPTIVE CATALOG

## **SIEWEK TOOL COMPANY**

FERNDAL, MICHIGAN, U.S.A.

The Safety Grinding Wheel and Machine Company of Springfield, Ohio, manufacturers of grinding wheels, provide the "Safety Grip-Lok Grinding Wheel", incorporating the features as shown in the diagram, right. Circular grooves are provided on each side of the wheel into which the flanges fit preventing the wheel from flying apart if the wheel should break. Circular grooves are illustrated by 2 and 5 in the diagram right while the flange is indicated by figure 4 in the diagram right.

The Lima Electric Motor Company, Lima, Ohio, has recently announced the Lima Type RS Splash-Proof Motor, which is designed especially to afford maximum protection against chips and filings, dripping or splashing liquids. The motor is recommended for application where open type motors are not suitable and is especially adaptable in other locations where a totally enclosed motor is not especially needed. This motor is furnished in all frame sizes from N.E.M.A. 204 to 365—H.P.  $\frac{3}{4}$  to 30 H. P.



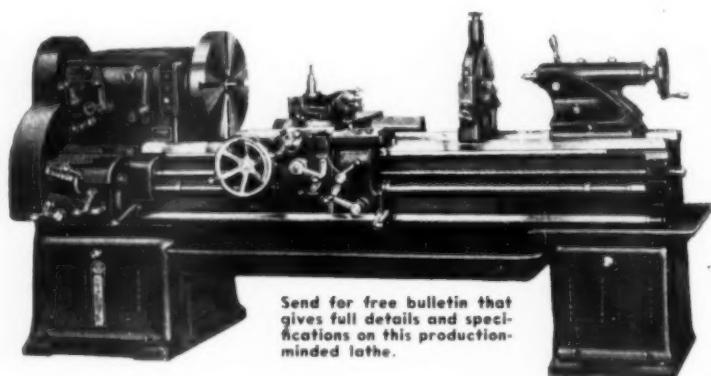
Safety Grinding Wheel's  
"Safety Grip-Lok"

**BRADFORD**

*Metalmaster*

**LATHE**

*constructed with*  
**CARE and PRECISION**



Send for free bulletin that  
gives full details and speci-  
fications on this production-  
minded lathe.

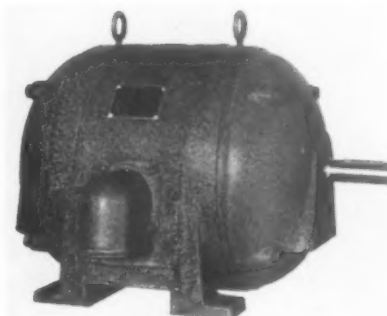
This rugged new lathe is just the machine for the fast tempo of war production! The headstock, driven by a constant speed standard frame motor, is rugged, simple, and exceptionally free from vibration. Heavy walls and a sturdy center bracing rib supports all the short intermediate gear shafts in tapered roller bearings. Double wall one piece apron,—wide range quick change device and many other features which you will find in booklet. Write for your copy today.

**ALSO MANUFACTURERS OF DRILLING AND TAPPING EQUIPMENT**

**THE BRADFORD MACHINE TOOL CO.**

CINCINNATI, OHIO

PRECISION TOOLS SINCE 1840

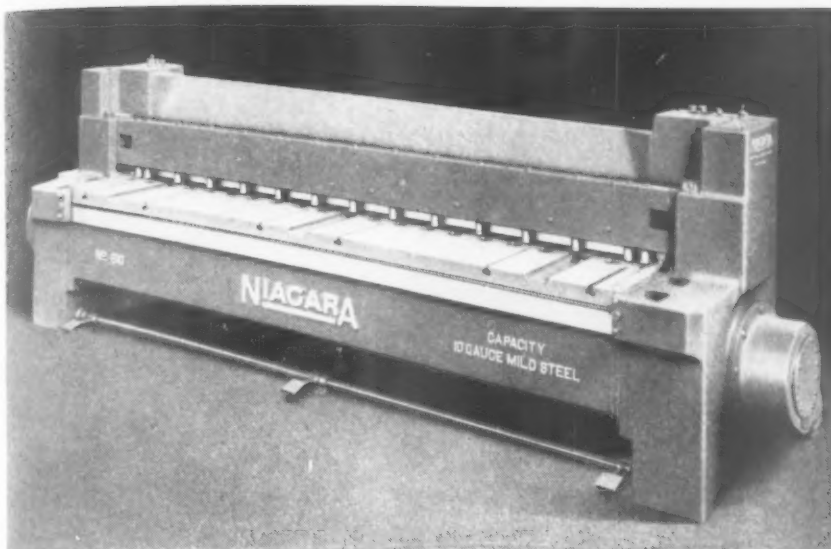


Splash-Proof Motor  
Made by Lima Electric

Toledo Scale Company, Toledo, Ohio, are manufacturers of the Propeller Balancing Scale shown in the illustration below. For production balancing of propeller blades longitudinally and transversely (horizontally and vertically) and to permit blades to be made in exact sets, or positive duplication at later date is the purpose of this scale—usually built to customers specification. Important features of this propeller balancing scale are micrometer-type poises:

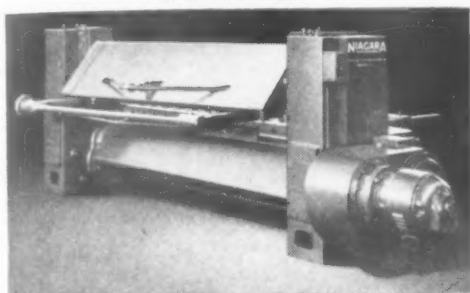


extreme accuracy and sensitivity. Transverse and longitudinal out of balance propeller blade may be quickly determined, it is claimed, permitting the blade to be positioned to definitely locate exact point where excess material must be removed to bring blade into balance. A record may also be kept of the blades and exact duplicate blades made at any time. Adapters for various size propellers are available. The balancing scale is built to balance all types of steel and aluminum blades.



**SERIES NO. 6 NIAGARA POWER SQUARING SHEAR**  
Capacities: 12 Gauge to 3/16 Inch—Cutting Lengths 4 to 12 Feet

The rear is open and accessible for picking up off-cut material.



## DEFENSE PLANTS ARE SPEEDING UP PRODUCTION WITH THESE NEW **NIAGARA** POWER SHEARS

America's leading Defense Plants including manufacturers of warplanes, tanks, and many other types of Ordnance Equipment are increasing output with these New Niagara Shears.

They operate at speeds of 85 strokes per minute on light capacity to 60 strokes per minute on the heavier capacity shears.

These New Niagara Shears cut sheared edges and narrow strips straight to within a very few thousandths of an inch.

They are built in a complete range of sizes and capacities.

**NIAGARA MACHINE & TOOL WORKS, Buffalo, N. Y.**

Branches: 50 Church Street, New York; Leader Building, Cleveland;  
General Motors Building, Detroit

## **APEX** *presents a check list of* **Power Bits and Hand Drivers**

### **Power Bits:**

#### **Kinds:**

- (a) For Phillips screws
- (b) For Slotted Head screws
- (c) For Clutch Head screws

#### **Types:**

- (a) For regular screw stock
- (b) For case-hardened, self-tapping screws

#### **Styles:**

For electric, air and spiral drivers

#### **Sizes:**

To fit all sizes of screw heads

### **Hand Drivers:**

#### **Kinds:**

- (a) For Phillips screws
- (b) For Clutch Head screws

#### **Types:**

- (a) For regular screw stock
- (b) For case-hardened, self-tapping screws

#### **Styles:**

Wood Handles  
Superloid Handles  
"L" and "LL" Drivers  
Service Drivers  
Hand Brace Bits

#### **Sizes:**

To fit all sizes of screw heads

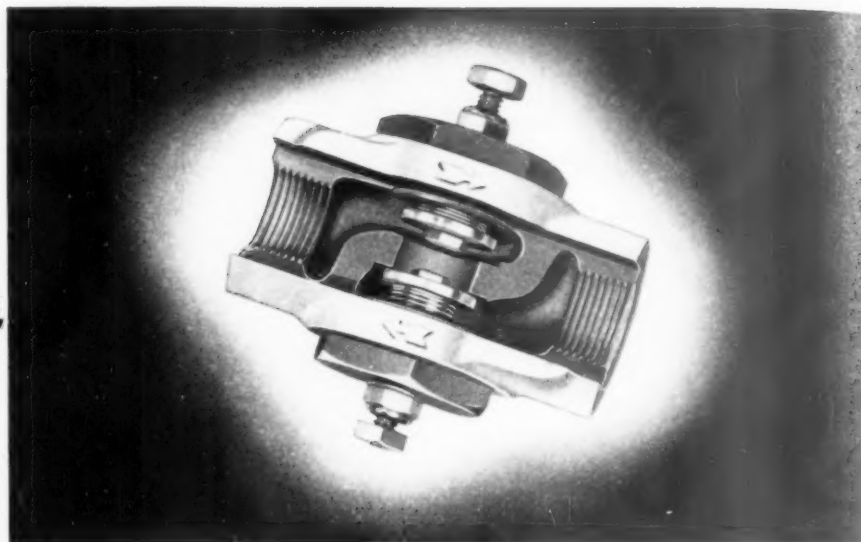
*Write for illustrated Catalogs*

# **The APEX MACHINE & TOOL CO.**

1106 Patterson Blvd.

Dayton, Ohio

*Here's* **FAST,  
2-WAY  
CYLINDER  
CONTROL...**



**Hanna Two-Direction Speed Control Valve**

For controlling piston speed in both directions. Installed between the operating valve and one end of a cylinder, it provides adjustable control of inflow as well as exhaust of the air independently to and from one side of the piston.

The valve body is cadmium plated and all other parts are made of corrosive resistant materials. Built for 250 lbs. maximum pressure, it is available in  $\frac{1}{8}$ ",  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ " and 1" pipe sizes.

Here's the solution to your cylinder speed control problems — Write today.

**HANNA ENGINEERING WORKS**

1765 ELSTON AVENUE

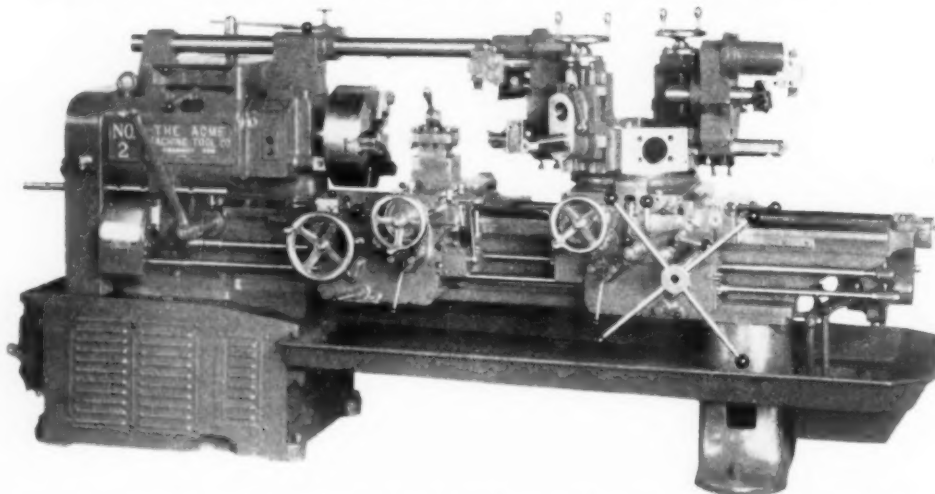
CHICAGO, ILLINOIS

Air and Hydraulic  
RIVETERS

Air and Hydraulic  
CYLINDERS

Air HOISTS

**RIGIDITY and ACCURACY  
UNDER HEAVIER CUTS AT FASTER SPEEDS!**



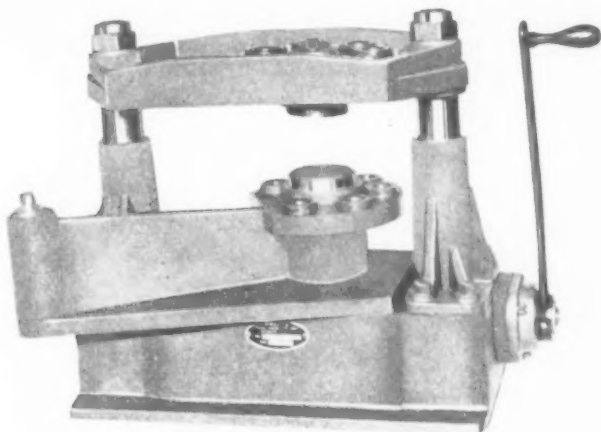
No. 2 Universal Turret Lathe with stationary overhead pilot bar and headstock brackets. Heavy duty multiple turning heads and vertical side tools and heavy duty reversible cutter holders. Also shown is the lead screw type chasing attachment with split nut brackets and threading dials on both carriages.

This machine with its stationary overhead pilot bar and headstock brackets together with rigid turret tooling permits heavy multiple cuts. Thus accuracy is assured, while faster speeds are possible through the use of cemented carbide cutting tools.

WRITE FOR COMPLETE DETAILS

**THE ACME MACHINE TOOL COMPANY**

CINCINNATI, OHIO



FIXTURE TO LINE BORE SIX HOLES IN MASTER ROD FOR AIRPLANE MOTOR. PART LOCATES ON TWO PLUGS AND IS CLAMPED WITH TOP PLATE

**SPEED UP  
TOOL DELIVERIES  
WITH STANDARD  
DRILL FIXTURES**

**ACCURATE LOCATING  
AND POSITIVE CLAMPING**

ALL PARTS ARE  
HARDENED AND GROUND  
ASK FOR CATALOG 238-C

## SWARTZ TOOL PRODUCTS Co., Inc.

13330 FOLEY

Detroit, Michigan

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Indianapolis—J. W. Mull, Jr.  
Milwaukee—Geo. M. Wolff, Inc.  
Houston—Engineering Sales Co.

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Canada—Hi-Speed Tools, Ltd., Galt, Ont.  
St. Louis—Mill Supply & Mach. Co.

Oneida, N. Y.—W. F. Himmelsbach  
Pittsburgh—J. W. Mull, Jr.  
Toledo—J. W. Mull, Jr.  
Philadelphia, Pa.—Morgan Tool  
& Equipment Co.

Get the

### INSIDE STORY

on Mac-it hollow set screws!

It's what you **don't** see in a hollow set screw that shows up in service. Here are a few of the "hidden qualities" packed into every Mac-it.

Produced from electric furnace steel, Mac-its are milled from solid bars to insure accuracy. Each angle of the sockets is accurately **cut** to insure positive key engagement.

Every Mac-it shown here is standard. For details call your Mac-it distributor or write us direct.

**LOCK IT!**  
Hollow lock screws are available for use with hollow set screws. Positive action is insured.

**THE STRONG CARLISLE & HAMMOND CO., Cleveland, Ohio**

## Handy Andy Says—



**H**AVING a lot of leisure of late, a/c working overtime seven days a week, along with little extras like writing this Col., I got around to visiting both the Student's Chapter and No. 1 during Feb. Those students, by

the way, are an up-and-coming lot with plenty of good timber for future A.S.T.E. officers. At No. 1, Lee Diamond surrendered the helm to Clyde Mooney, and the rest of the staff was stepped along. What pleased me particularly was the election of Prof. O. W. Boston, head of U. of M. Tool Engineering School, to a vice chairmanship. Prof. Boston is a recognized educational leader in our field and has made outstanding contributions to the art of metal processing, merits our fullest recognition.

The speaker of the evening was d'Arcambal, metallurgist and vice prex.

of Pratt & Whitney and popular past prex. of the A.S.T.E. Y'know, that guy's got that indefinable something, whatever it is. I remember the first time I heard him speak, up in the Fort Shelby ball room. Detroit was just a local then, but d'Arc was still answering questions when I pulled stakes at midnight. He repeated t'other night, but I didn't wait for the milkman a/c I didn't want to make a lot of unnecessary explanations when I got home. Anyway, d'Arc is an educational institution all by himself—and may his shadow never grow less.

**How *Atlas* SERVES THE NATION**

**Meeting  
SCREW  
MACHINE  
Needs**

**★  
QUICKER  
DELIVERIES  
NOW  
On Preference  
Rating  
Certificates**

*These pictures from the Inland Manufacturing Company in Buffalo, N. Y. show how Atlas equipment is helping in vital war production. Inland makes parts for Bell Aircraft and also for gun mount adapters. Tailstock and carriage turrets of the Atlas lathes greatly increase production on many operations such as turning, centering, counterboring, end milling, grooving, threading and drilling.*

New production machinery and the determination of Atlas workers to help avenge Pearl Harbor have increased production the past few weeks. Quicker deliveries are now possible on preference rating certificates.



**ATLAS PRESS COMPANY**

314 N. PITCHER STREET, KALAMAZOO, MICHIGAN

**LATHES • DRILL PRESSES • ARBOR PRESSES • SHAPERS • MILLING MACHINES**

From one thing to another, it's long been a mooted question as to what would happen if the irresistible force met the immovable object. But O. B. Jones, master mathematician and Prex. of Detroit College of Applied Science along with being founder and (aptly) historian of the A.S.T.E., tried out a practical solution on a small scale last fall. Up after his deer in the Nawth woods, he barely missed reaching the Happy Hunting Grounds when a speeding car hit him as he stepped out of his own machine somewhere in the sticks. O. B., as the immovable object, got variously bruised, contused and fractured, but is now happily on the mend, thanks largely to good nursing on the part of his best-of-all, Mrs. Jones. I didn't want to say anything about this before a/c being afraid O.B. might be sensitive on the subject of hunting. But please, O. B., be careful from now on! You've a lot of friends, even if they can't come and visit right now a/c they're plenty busy so it's not a case out of sight, out of mind, and we don't want anything amiss to happen to you. As for me, roast beef rare; venison's too reminiscent of tough goat.

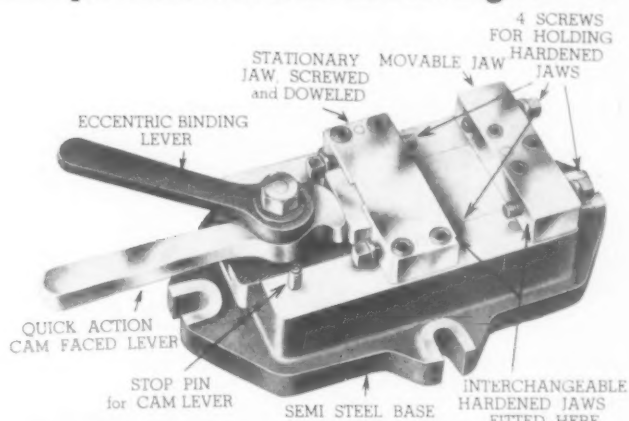
Speaking of bedtime stories, Wallie Herman, tool room supt. at Midland Steel, has been on the sick list for the past several months, and you boys might send him a card of cheer. Wallie's an old wheel horse in the A.S.T.E. mainly conspicuous by absence from the meetings but usually there with his dues. Anyway, he's a swell fellow and a prime favorite, so keep him in mind. (P.S. Never mind the condolences; I just got word that he's back on the job. So, we'll razz him instead).

Ed Beyma, however, a hard worker for the Society and a key man with Al Sargent's Pioneers, is seriously ill at Mt. Carmel Hospital, Detroit, after an emergency appendectomy. To make matters worse, his family is quarantined with scarlet fever, so that he is de-

**THE TOOL ENGINEER**

## NEW PRODUCTO CAM LOCK VISE for production milling and drilling

One jaw is stationary or fixed and the milling action or thrust is taken against this solid jaw. The movable jaw is controlled by the quick-acting handle. This construction permits a very wide opening of the jaw and is quickly obtained. For work that is mounted in false jaws, this large opening is an advantage.



The eccentric or top lever actually does the binding or tightening of the movable jaw thus securing absolute clamping. An operator familiar with the use of this vise can operate both handles with one hand. This type of vise is made in three sizes known by the width of their jaws as 4", 5" and 7".

### SERVICE ON DIE SETS

Three assembly and shipping plants for die sets, six sales offices stocked with die makers' accessories, and at two points on the Pacific coast make Producto service on die sets and accessories for tool and die makers nation-wide. EAST: Factory 990 Housatonic Avenue, Bridgeport, Conn. MIDDLE WEST: Factory 3017 Medbury Avenue, Detroit. Die Supply Co., 1390 E. 30th St., Cleveland. WEST: Stock, Jos. C. Fletcher, 1415 Folsom St., San Francisco. Frey Industrial Supply Co., 3828 Santa Fe Avenue, Los Angeles.

## THE PRODUCTO MACHINE CO.

BRIDGEPORT, CONN.

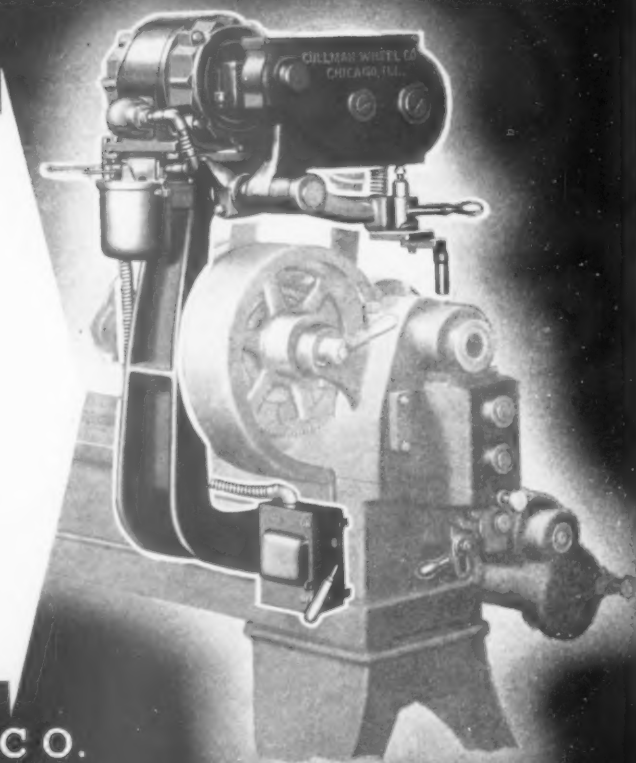
3017 MEDBURY, DETROIT, MICH.

## TRY A CULLMAN DRIVE FOR 60 DAYS —without obligation

Get maximum production from lathe, punch press, shaper, or other shaft driven machine with the modern CULLMAN Motor Drive.

Instant, handy control and belt drive smoothness afford 25% time saving on many operations. The CULLMAN Individual Motor Drive can be installed at a surprisingly low cost. It is made to take motors from ¼ to 15 H. P.

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CULLMAN WHEEL CO.

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nied visits of his dear ones. I know what that means, having been through the same thing once, and the Beymas have my kindest sympathy.

Well, another A.S.T.E. year draws to a close, with such of the boys as can get away from the grind planning to attend the Annual at St. Louis. Speaking for myself, the prospect is intriguing but dubious, having had one of Uncle Sam's kiddie car jobs (especially designed for benefit of Ad Hitler, Ben Mussolini and

Son-of Heaven(?) Hirohito) dumped into my lap. As for the retrospect, it's marred only by a wish that I could have re-written each past Column somewhat nearer to the heart's desire. I always think of the good stuff after the copy's turned in. At that, there are no real regrets; no one has been traduced in these pages, no characters tarred. There has been no echoing of editorial lambast, and what sting may have been imparted by an occasional flick at the politicians and their red tape has been assuaged by the balm of understanding

for human weaknesses. Long ago, I sensed the inevitable inclusion of America in this war, even as I sensed the eventual alliance of Russia with the democracies, although, like the most of us, I was agin the Reds when they hopped the Finns. Too bad, by the way, that those rugged, erstwhile defenders of democracy should now be on the wrong side of the fence. But that is accident, not design, and I am quite certain that the Finns will switch to our side once they have some assurance of territorial integrity. Right side or wrong, people will fight for their homes,

*Keep Your Assembly Lines Stepping!*



**Machine Your Parts *Faster* With  
TECO CARBIDE TOOLS**

Assembly lines can move no faster than the supply of parts permits. Where machined parts are involved, the machine shop often sets the pace for the entire plant.

Increase your parts production, by speeding up machining operations with TECO Carbide Tools. Run your machines at capacity—get more pieces per grind—save down-time for re-tooling—hold accurate tolerances for longer runs—reduce rejects. No idle claims these, but FACTS proved every day in the nation's largest machine shops.

TECO Carbide Tools, in grades and styles for practically every machining need, are available for prompt shipment.

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570 39th Street • • • Union City, N. J.  
Branch Office: 2906 Euclid Avenue, Cleveland, Ohio  
Pioneers in Tungsten Carbides for Over a Quarter Century



The Alphabet Corps seems to be somewhat perturbed because America appears apathetic to the emergency. What do they want, paean of joy because we're at war? No, we're not apathetic, rather, grimly purposeful, and speaking for the Tool Engineers, too damned tired from overwork to act as cheer leaders. We're doing our stuff without fanfare of trumpets, slowed up more by government red tape than because of any lack of will or even of actual accomplishment. Industry is burning its peacetime bridges behind it, and the engineers ruthlessly apply the torches. You know, the situation has its ironic aspects. One concern scrapped a machine that had taken years to develop, while conveyor lines and machine foundations, representing long planning and fortunes in money, are razed and leveled without even a sigh of regret. Personally, I had designed a Rube Goldberg that promised to be a world beater, and had the pleasure of seeing it meet all expectations in a trial run. But there she stands, a monument to what I'd term Tool Engineering ingenuity if someone else had fathered it—and a frozen asset as far as my employers are concerned. Yet, it's not a total loss; the ideas are there, to be applied to winning the war and, let us hope, to win the peace as well. No, America is not apathetic, rather, be it said to our eternal credit that we're working close to the limit of human endurance. Even Hitler, with all his task masters, can't spur his people to greater effort than that.

Speaking of politicians, I often wonder how they get that way. Like this guy Connolly, f'instance. Here we send good will diplomats to Latin America, and just when the brass hats down yander are ready to sign on the dotted line this dampfool kibitzes the sales talk! I used to think the Irish were smart politicians, but I dunno. Take Eamon

(Continued on page 190)

THE TOOL ENGINEER

## Inspection of Production Is Vital Use the Scherr Inspection Laboratory

Safeguard your production from the scrap pile. Machine tools may be speeded up, hours saved by better-set-ups, overtime and extra shifts may be installed. Yet this will be of no avail if your product is inaccurate, if rejections and disputes slow up production.



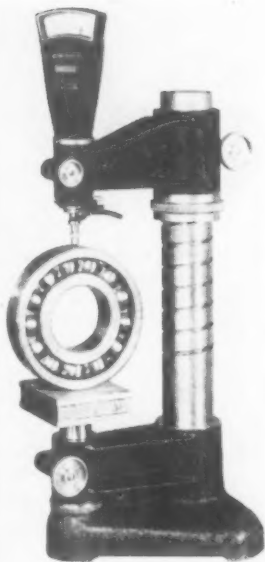
### The Wilder Projector

The Wilder Projector enables you to see exactly where tools, templets, gages, threads, etc. vary from specified dimensions and contours and how much they are out. Magnifications from 10 x to 100 x. Base price, \$267.50 f.o.b. Waltham.

### The Scherr Comparitol

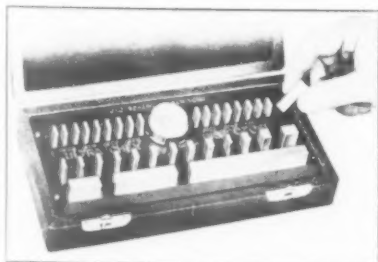
The Comparitol gives accurate, dependable readings in .0001" or .00005" and measures length, diameter, thickness, etc. Gage blocks, plug gages, tools, parts are checked for size, tolerance and wear. Mass produced parts such as bearings, pins, bushings, are rapidly inspected without dependence upon the skill or "feel" of the operator. Standard size, 0-6", \$195.00 f.o.b. New York; Heavy-Duty, 0-8", \$250.00 f.o.b. New York.

Illustrated is the Heavy-Duty COMPARITOL.



### The Inspectoset

A set of gage blocks like the ULTRA-CHEX illustrated is a necessity to provide the basic standard of measurements from which all production starts and all measuring tools and gages used throughout the shop are checked and set. Large and small sets are provided. 34 block set, \$125.00 f.o.b. New York.



Write, wire or telephone Canal 6-1464 for quotation and delivery dates of the complete Scherr Limited Budget Inspection Laboratory.

**GEORGE SCHERR CO., Inc.** 132 Lafayette St.  
New York, N. Y.

MARCH, 1942

**NEW**  
*no splash!*



## HAMMOND "10-A" & "14" CARBIDE TOOL GRINDERS

**A**n Innovation! New Wheel

Guards prevent splash or spray in wet operation. Hammond's new "10-A" and "14" Grinders give greater working area around wheels . . . full view of the work . . . which permits faster, more accurate grinding. **WRITE FOR LITERATURE.**

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Eastern Branch, 71 West 23rd Street, New York City

# A. S. T. E. DOINGS

By IRWIN F. HOLLAND



## Four new Chapters

In the past few weeks, four new chapters have been brought into the A.S.T.E. organization. These new chapters, which bring the total to 52, are the North Texas, the Williamsport, the Montreal, and the Wichita Chapters.

On January 24 at the Lycoming Hotel, the Williamsport Chapter number

49 came into being. Ray Morris and Clyde Hause, national second vice-president and secretary respectively, were on hand to help Mr. Howard Stratton of Elmira, N. Y., sponsor of the meeting, present the new charter. They installed as officers for the coming year, Mr. E. L. Greer chairman, Louis Bleicher secretary; and Harold Shafer treasurer. Mr.

Morris then gave an interesting talk on "The Importance of Tool Engineers". There were 39 charter members.

The Montreal group was chartered the night of February 14 by second vice-president Ray Morris and is the 50th Chapter of the A.S.T.E. This first meeting brought forth 65 applicants from an excellent turnout of 90 men. Mr. Arnold Thompson, who so ably piloted the Toronto Meeting, has been very active in the organization of this Chapter. Officers inducted were, John Hall chairman, Herbert E. Gibson secretary, Edward N. Kingsland treasurer, James M. Davis first vice-chairman, and Robert B. Douglas second vice-chairman.

The 51st Chapter was organized on February 16 at a dinner meeting in the Jefferson Hotel, Dallas, and will be called the North Texas Chapter. Mr. Frank Curtis, president of the Society, presented the Charter to a group of seventy charter members, after giving an outline of the organization's history and purpose. Floyd Doty of the Houston Chapter was present and pointed out the rapid advancements made in the field of tool engineering in the past ten years. Mr. Emil Shetlin, who handled most of the ground work in organizing the Chapter, was elected chairman. Other officers elected were, Richard E. Hager first vice-chairman, William N. Oswald second vice-chairman, Jack J. Vanderwell treasurer, and Claude N. Wilson Jr., secretary.

The Lassen Hotel in Wichita on the night of February 17 was the scene of the chartering of the 52nd Chapter of the A.S.T.E. Eighty new members and many guests took part in the ceremonies. Frank W. Curtis, president, officiated with the assistance of Mr. M. M. Ross, who was instrumental in forming the Chapter. After Mr. Curtis explained the purposes and the aims of the Society, an election of officers was held. Those elected were, Carl A. Burnham chairman, M. M. Ross first vice-chairman, John W. Rix second vice-chairman, J. W. Courtney treasurer, and Charles C. Colvin secretary.

## Binghamton

The Binghamton Chapter held its regular meeting on Wednesday, January 7, at the Arlington Hotel, Binghamton. Members elected Mr. Edwin Burger and Mr. Arthur Becker as the nominating committee for 1942. Announcement was made that election of officers will be held at the February meeting. Mr.

**Everywhere...  
SKILSAW TOOLS  
are at the Front  
in the Battle  
of Production!**

**Skilsaw Disc Sanders—6 Models.** Speed up all sanding, grinding, filing, metal cleaning and polishing on flat or curved surfaces of wood, metal, compositions.

**Skilsaw Belt Sanders—4 Models.** Finish faster, smoother on wood, metal, stone or compositions. Ideal for every job from coarsest sanding to finest honing.

**Skilsaws—9 Models.** Speed up all sawing. Save time in plant expansion, remodeling, maintenance. Cut flat or corrugated metals in production.

**Skilsaw Drills—23 Models.** More drilling power—more holes per hour. Speed up all drilling from lightest production work to heaviest boring and reaming.

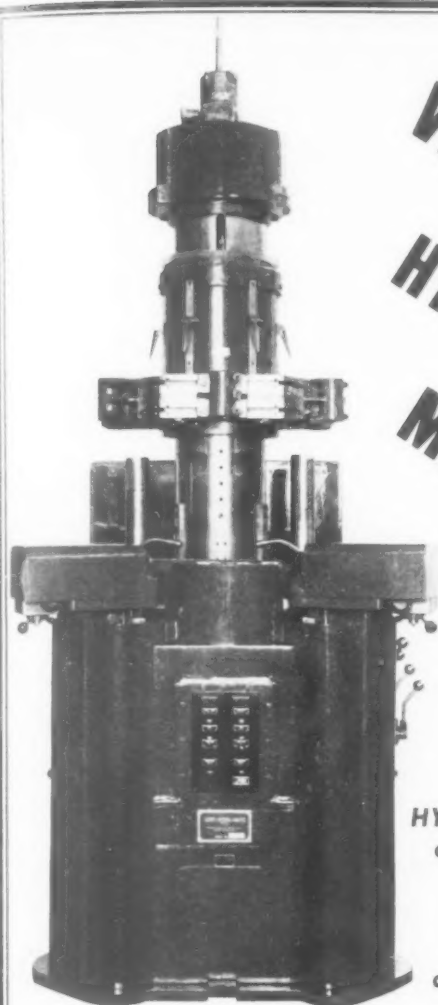
Wherever the fight for production is fiercest—wherever war materials are being built fastest you'll find SKILSAW TOOLS at work... speeding up jobs in every industry... making each man, each minute more productive... saving days and dollars for quicker Victory!

SKILSAW TOOLS are rugged, reliable, powerful. They work faster, handle easier and do more kinds of jobs. That's why they're preferred so widely in plants making aircraft, tanks and other war materials. That's why they belong in your plant, too, to build fast what America needs right now! Ask for a demonstration of SKILSAW TOOLS.

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★ FOR THE DEFENSE OF AMERICA ★



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**VERTICAL  
chuck**

**HYDRAulically  
operated**

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## Chucking Machine

### ★ SPECIFICATIONS ★

**SPINDLE:** Nose 6" diameter, type A.

**BEARINGS:** Precision taper roller type.

**SPEEDS:** 18 spindle speeds; 15 to 1000 R.P.M.

**CAPACITY:** 16" maximum diameter, 9" full boring bar depth of turret.

**SIDE HEADS:** 12" vertical movement, 3 1/2" horizontal movement.

**FEEDS:** All hydraulic.

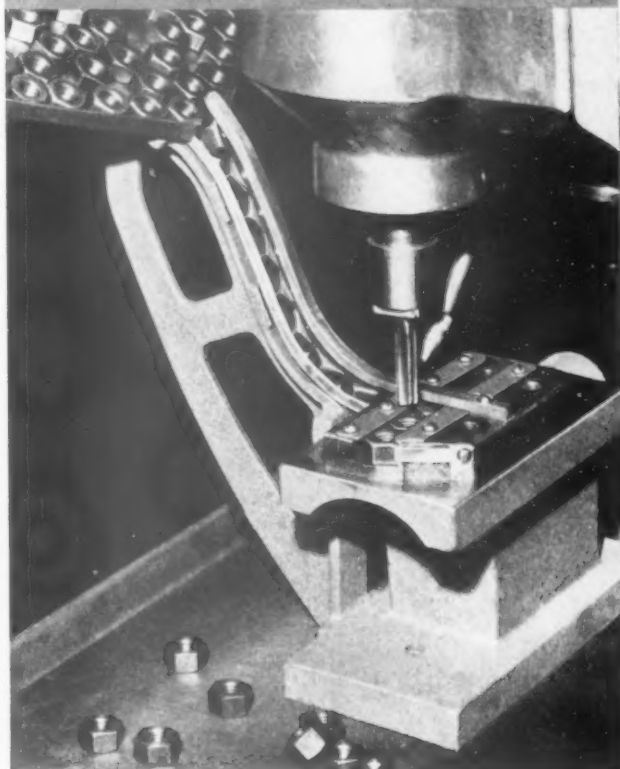
**TURRET:** 6 faces 15" x 5 1/4" wide, fitted with 2 T slots.

**HEIGHT OF SPINDLE NOSE:** Working height, 42".

**MOTOR:** 7 1/2 H.P.B.B. 1150 R.P.M. 3-60-220/440 V. or to suit.

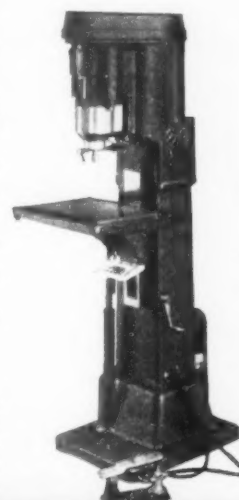
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**PRODUCTION MACHINERY DEVELOPMENT CO.**  
4845 ST. AUBIN DETROIT

**FOR THE DURATION...  
AND THE YEARS BEYOND!**



Haskins designed standard nut fixture with an air operated plunger positions these 3/8" hex nuts and ejects them after tapping. Operator has only to place the blanks in the hopper. Class 3 fit.

**MORE** than a temporary speed-up measure, Haskins Tappers are a profitable, long-term investment in production efficiency. Bought for war time needs, they can be quickly and inexpensively converted to private industry production. Haskins Tappers are *standard* machines. They will *continue* to give you lower tapping costs per man and machine hour long after Victory is won! R. G. Haskins Company, 2756 W. Flournoy St., Chicago.



**NEW BOOKLET—"Holding Fixtures for Haskins Tapping Machines"—** contains many new ideas. Send for a copy.



**HASKINS**

*Precision*  
**TAPPING  
EQUIPMENT**

Lenox introduced Dr. Randall Mac T. Robertson, Physicist of Norton Company who presented the subject "Measuring Surfaces." Slides were shown explaining the various methods of measuring ground surfaces and the advantages or disadvantages of each. "Super-finish" was explained as well as the method used by other manufacturers to secure the desired result.

### Chicago

The Chicago Chapter held its monthly meeting at the Midwest Athletic Club

on February 2. Chairman Goransson opened the meeting at 8 p.m. and announced that the first business would be the election of officers for the new year. The results of the election were as follows:

Chairman—Roy Hoefler  
1st V. Chairman—L. Biehler  
2nd V. Chairman—F. Martindell  
Secretary—F. Schmitt  
Treasurer—H. Taylor.

Mr. Goransson next announced the March meeting and mentioned the fact

that exhibit and door prizes would be given at the Smorgasboard and smoker. He also told of the possibility of having a talk by Mr. Tabb of the Tabb Management Research and Production Company and introduced Mr. Mays, who gave a brief description of Mr. Tabb's ideas and what he would talk about if such a talk was given.

Mr. Goransson introduced Mr. Biehler who introduced Mr. M. A. Scott of the Greenlee Foundry Company, Chicago who gave a talk entitled "Mechanite—Its Manufacture and Application in Industry" illustrated with slides.

Following the technical questions, Mr. Roy Hoefler showed a film entitled "The Tool Engineers Golf Tournament in 1941" which showed the various members in action and which proved to be very interesting.

### Cleveland

"The time that we have to arm this nation is terribly short," Malcolm F. Judkins of Pittsburgh told 150 members of the Cleveland Chapter at the organization's February 13, meeting. Mr. Judkins is Chief Engr. of Firth-Sterling Steel Co.'s Firthite Division and spoke on "Making of Firthite Sintered Carbide Tipped Tools."

The speaker explained how sintered carbide tipped tools can be made in the average machine shop with standard equipment. One of the more recent applications of sintered carbide tips is on drills for boring rifle barrels.

Prior to Mr. Judkins' talk, the following new officers of the Cleveland Chapter were elected for the year 1942 and 1943:

Chairman—C. W. Scheihing  
1st V. Chairman—Wm. Reiff, Jr.  
2nd V. Chairman—J. K. Fitzgerald  
Treasurer—E. L. Mack  
Secretary—R. H. Alexander.

### Columbus

The Columbus Chapter held its monthly dinner meeting at Hotel Fort Hayes. This was a joint meeting with the Society of Automotive Engineers. Mr. Paul Johnson of the Engr. Dept. of the Thompson Products, Inc., was the speaker of the evening. The speaker's subject was "The Tool Engineer in our Defense Program," which was well presented.

Following the technical session, the election of officers took place, with the following results:

Chairman—Wm. A. Flumerfelt  
V. Chairman—Thos. F. Starkey  
Secretary—Chas. Wm. Warner  
Treasurer—Edward J. Miller.

**FOUR-IN-ONE!** The conserving of material—the shortening of time—the lessening of labor—and the saving of money. Each one is an accomplishment. The "four-in-one" is an achievement.

"Four-in-one" as just stated is the very definite contribution that the Severance Tool Company has made to Fitting and Finishing throughout the Metal, Wood, and Plastic Industries.

In 1930, Mr. R. M. Severance gave his attention to Hand Cut Rotary Files, and especially to the waste in the fact that "hand cut files must be scrapped" without virtue of being resharpened.

This thought and subsequent efforts led to the birth of MIDGET MILLING CUTTERS. "Ground from the Solid after Hardening" makes "regrinding" possible; and, also, the "four-in-one saving" . . . ONE, in conserving High Speed Steel—TWO, in faster performance—THREE, in longer operational life—and FOUR, in money saved through "Regrinding", which reclaims most of the Severance Midget Cutters even scores of times.



MANUFACTURERS OF  
Midget Milling Cutters —  
"Chatterless" Countersinks  
—Tube Deburring Cutters  
—and Special Tools.

Although delayed deliveries are still in evidence, Severance continues to think in terms of Engineering Service, and in greater Production and Regrinding facilities, including their completely equipped Western Service Branch located at 3844 S. Santa Fe Avenue, Los Angeles, California.

## SEVERANCE TOOL COMPANY

1522 East Genesee Avenue  
SAGINAW, MICHIGAN

**"REGRINDING SAVES STEEL, TIME, LABOR, AND MONEY"**



## MILFORD PROFILE SAW

(The blade for all internal-external metal cutting)

### HANGS THIS SIGN ON YOUR BASIC MACHINE TOOLS

Use a contour sawing machine, or any vertical, metal-cutting band saw machine equipped with Milford Profile Saw, for odd jobs of parts, special tools, dies, jigs, etc. You will make them to better advantage.

Milling machines, shapers, lathes, drill presses, or other production equipment, if used for such odd jobs — plays havoc with your schedules.

MILFORD PROFILE SAW helps you keep your basic machine tools doing straight production work.

You may have a band saw machine that can be adapted to Profile Sawing. If so, write us for directions. You will find it well worth while.

Write for a free sample of Milford Profile Saw, giving specifications of blade you now use, or description of cutting job and machine.

A machine for contour sawing is no better than its saw. Milford Profile Saw is made, and guaranteed by the world's largest, most experienced producer of metal-cutting band saw. Carried in stock by Mill Supply Distributors in every locality.

THE HENRY G. THOMPSON & SON COMPANY  
NEW HAVEN, CONNECTICUT

# MILFORD

★ PROFILE SAW ★

Also makers of REZISTOR HACKSAW BLADES

MARCH, 1942



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**SAVE!**  
**CONSERVE!**

## TOOL STEELS

BY USING

*Eureka* **TOOL STEEL  
WELDING RODS**

We originally planned to devote this space to the praising of our products. We finally decided it would be more fair to you as a user and ourselves, as a manufacturer, to put it this way—drop us a note telling us where conservation of tool steel is needed in your plant and we will mail you complete literature that lists and explains the various types, their characteristics, proper applications and treatment. Should your answer not be found in this literature, our research force will prescribe the proper electrode and outline the best methods for its use. **THEN** after using our electrodes, **YOU** will do the praising—we won't have to.

**WELDING EQUIPMENT & SUPPLY CO.**  
DETROIT, MICHIGAN

Retiring Chairman, Mr. S. J. Matchett, Jr., thanked his officers for their co-operation during the year.

#### Dayton

The Dayton Chapter held its dinner meeting on February 9 at the Gibbons Hotel.

After dinner, the annual election of officers was held, at which were elected the following officers:

Chairman—Howard McMillan  
1st V. Chairman—Jack Blair

2nd V. Chairman—Walter Olt  
Secretary—Frank Steinbrunner  
Treasurer—George Bollman.

After the election of officers, an open forum was held on the subject of "Welding in Defense Work." Mr. Milton Feldstein led the discussion assisted by associates from the Delco Products Corporation.

#### Fond du Lac

The February dinner meeting of Fond du Lac Chapter was held at the Athearn

Hotel in Oshkosh, Wisconsin on February 13. Vice Chairman, A. F. Schroeder, presided at this meeting. Beaming and smiling Charles Billberg of the Wisconsin Axle Division presented a sample of his cigars to a rival member from Fond du Lac. The new program committee presented a program which was of interest to a large attendance of members and visitors from Oshkosh, Kohler, Sheboygan, New Holstein, Brillion, Ripon, Kaukauna, Appleton and Fond du Lac. Guests presented were:

C. Wheelock, Milwaukee  
R. B. Weeks, Chicago  
B. Burgoon, Rockford  
C. W. Cromer, Milwaukee.

The speaker of the evening was Mr. Phillip M. McKenna, President of the McKenna Metals Company, Latrobe, Pa. His subject "Steel Cutting Carbide Tools" was very well illustrated with movies and slides. The questions and discussion concerning the applications and comparative properties of these tools was an inviting topic at this time for all the technical men present. The question period brought out interesting comments concerning "chip breakers" and possibility of turning of various parts at relatively high speeds.

#### Western Michigan (Grand Rapids)

The Western Michigan Chapter held its monthly meeting on Feb. 9. Mr. S. J. Bell, Engr. for the Norton Company, spoke on "Abrasives and their Uses." His talk was illustrated by two reels of movies equipped with sound. These movies showed how grinding wheels are produced from the raw product to the completed wheel, also the various uses, and what grade to use for different types of grinding. Several questions were asked regarding grade, grain and hardness—all of which were answered by Mr. Bell.

The main issue of the business meeting, which followed was the election of officers. The following members were elected for the various offices:

Chairman—E. Rossien  
Vice-Chairman—G. H. Hoogerhyde  
2nd V. Chairman—Vern Bathrick  
Secretary—C. Hanish  
Treasurer—H. E. Goodfellow.

The April meeting will be held in Kalamazoo.

#### Hamilton

The Hamilton Chapter held its monthly meeting at Royal Connaught Hotel, Hamilton, on January 8. The total attendance was sixty-two with forty-four attending the dinner.

The minutes of the previous meeting, held December 13, were read and



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DETROIT, MICH.



## CARBIDE TIPPED TOOLS

FOR TURNING - FACING - REAMING - SPOTFACING - BROACHING  
FORMING - GRINDER RESTS - WEAR PARTS - BORING - MILLING - DRILLING  
GROOVING - COUNTERBORING - SHAVING - CENTERS - SPECIAL PURPOSES



REAL ECONOMY is measured in performance records, not by the purchase price alone. Reports from war material manufacturers and lathe operators all over the country say "it's real economy to own an Axelson Lathe" because three things are built into each Axelson Lathe essential to profitable machining operations. First, you can obtain a

wide range of operating speeds and feeds necessary for fast production. Second, the accuracy and rigidity of Axelson Lathes has been established under all operating conditions. Third, they run smoothly year after year with minimum of maintenance costs.

To sum it up—into each Axelson Lathe is built three essentials of satisfactory lathe operation—speed, accuracy, and minimum production cost.

#### READ AND COMPARE

24-Speed Headstock  
Unit Mounted Constant Speed Motor  
Hardened and Ground Gears  
Automatic Brake  
Double Clutch For Forward and Reverse Spindle Rotation  
Automatic Lubrication of Half-Nut and Lead Screw When Threading  
Anti-Friction Quick Change Gear Box  
Automatic Lubrication of Bed Ways, Cross Slide, Compound Slide, Cross Feed Screw Nut and Compound Screw Nut  
Automatically Lubricated Apron  
Rigid Taper Attachment  
Accurate Master-Milled Lead Screw  
Cam-Lock Spindle Nose  
2-Speed Tailstock Spindle

**AXELSON MANUFACTURING CO.**  
6160 S. BOYLE AVE., LOS ANGELES, CALIF. (P. O. Box 98, Vernon Sta.)  
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3844 WALSH STREET, ST. LOUIS

**WRITE TODAY** for YOUR copy of Axelson's latest lathe bulletin giving detailed information of sizes and specifications.



**BEFORE YOU BUY  
ANY LATHE  
INVESTIGATE**

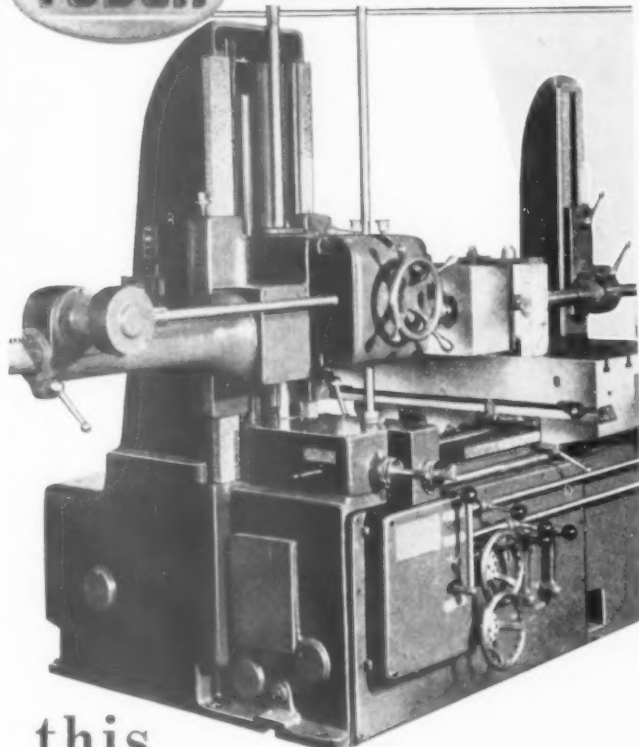


**AXELSON**  
24-SPEED HEAVY DUTY  
**LATHES**

MARCH, 1942

Consistent with the  
High Quality of all

**YODER MACHINERY**



## this HORIZONTAL BORING MILL

Successfully meets the most exacting speed and accuracy requirements of the experienced operator, yet readily lends itself to a variety of work by young machinists or new trainees.

Adjustment dials are extremely legible and all controls are within unusually easy reach—one man can easily set up a large job. Milling cutters are easily attached to spindle flange.

No. 5 Morse Taper, 24-inch traverse of bar 24" x 48" Table.

16 Power Speeds for Head, Saddle and Table, in any direction.

These with many other exceptional features combine to make a machine that will give a long service life with volume production of accurately machined parts. Write TODAY for Complete Information. Prompt Deliveries.

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YODER ALSO MAKES:

Coilers, Uncoilers, Scrap Cutters, Slitting Lines, Tension Reels, Bending Machines, Beading Machines, Brake Shoe Machines, Roll-Forming and Flying-Cut-off Machines.

adopted. Nominations for the Nominating Committee were received. Election followed and J. N. Walton and C. Douglas Wright were elected.

Mr. Arthur Downs of Gilbert, Lodge & Company, Pty., Ltd., Melbourne, Australia, was a distinguished guest at the meeting. He gave an interesting address dealing with war production in Australia and his impressions of his tour through Canada's manufacturing plants engaged in war work.

Mr. J. N. Walton introduced the guest speaker—Mr. Burns George,

Chief Metallurgist of Vanadium Alloys Steel Company of Pittsburgh, Pa., who delivered a most interesting and instructive talk on "Molybdenum High Speed Steel".

#### Hartford

The night of February second was election night for the Hartford Chapter. As usual, the evening started with a dinner at the Hartford City Club at 6:15 p.m.

The election was a real feature attraction this year. This time the candi-

dates were nominated by the committee as in the past, but there were two for each office. Not only that, but there were one or two nominations from the floor also. The election was hotly contested with two balloting being necessary to get a majority for some of the offices. The final list of new officers for the coming year are:

Chairman—Harry Hauck

1st V. Chairman—Carl W. Moeller

2nd V. Chairman—Henry A. Rockwell

Secretary—Clayton S. Parson

Treasurer—Edmond Morancy

The slate is a good one, and fine things are expected of the coming year.

The technical session was conducted by Henry J. Anthony, Supt. of Whitney Chain & Mfg. Company, who did a capable job of introducing the speaker of the evening. The subject of the talk by Mr. E. S. Gardner, Pres. of the Hartford Electric Steel Corporation, was "Electric Steel Castings." His talk was high lighted by a very fine talking stereoptican treatise showing the pitfalls to be avoided in the design of parts to be cast by the electric steel process. Shrinkage was strongly emphasized as it amounts to 12% in the case of this type of casting work. "Hot spots" were demonstrated and the way to overcome them in the design was pointed out.

#### California (Los Angeles)

The California Chapter held its monthly meeting on January 8. A pledge of Allegiance to the Flag was the first order of business. Nominations were asked for a three-member Nominating Committee to nominate new officers at the February meeting. Messrs. Anton Peck, A. H. Bowlzer, and R. F. Dorn were elected.

A lecture, moving picture and demonstration of the manufacture of synthetic rubber was given by Mr. L. P. Reuland of the B. F. Goodrich Company. A paper was read by Dr. Kenton J. Leeq on "Plastics for Production." Assisted by Mr. R. E. Garwood of the Baker Oil Tool Company in the answering of questions, this subject aroused great interest and prolonged discussion followed.

It was decided by vote to continue the second Thursday in the month for meetings.

#### Milwaukee

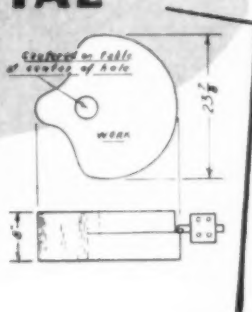
At the regular meeting of the A.S.T.E. on Thursday evening, February 12, Mr. H. A. Frommelt of the Kearney & Trecker Company spoke to the Society on "Plastics in Defense".

Mr. Frommelt made this comment, that "too often we look upon plastics as a novelty, dimestore project, or a substitute for some other material." He em-

## HOW THE GREATER STRENGTH OF KENNAMETAL

PERMITS INCREASED PRODUCTION WITH LOWER TOOL COSTS

SAE 4140 forging, machined with Style 3 KENNAMETAL tool. Note interrupted cut resulting from the irregular shape of work piece.

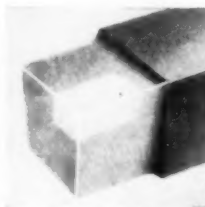


KENNAMETAL Grade KM, the grade most commonly used in machining steel up to 550 Brinell hardness, has a transverse rupture strength of 305,000 lbs. per sq. in. Harder grades of KENNAMETAL also have relatively high strength compared to other tool carbides of the same hardness. The high rupture strength of KENNAMETAL offers the following advantages to users of steel-cutting carbide tools:

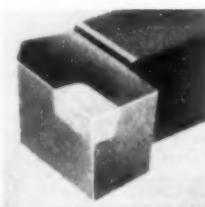
- Takes interrupted cuts, and roughing cuts on scaly surfaces, without tool breakage. Many jobs thought too tough for carbide tools are now machined at high speeds and with long tool life using KENNAMETAL.

- Can be used at heavier feeds than other carbides. The greater chip thickness of steel cut with KENNAMETAL means faster stock removed than when lighter feeds must be used.

- No "sandwich" brazing required. When brazing KENNAMETAL blanks to tool shanks, the brazing material is allowed to run freely over the surface of the recess, the tool (with blank in place) is heated, the blank is pushed firmly into place, and the tool is allowed to cool. This simplified brazing procedure results in lower tool costs.



STYLE 3 TOOL

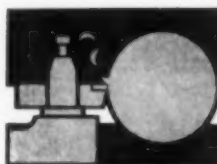


STYLE 21 TOOL



It costs you no more to use KENNAMETAL—the harder, stronger, more crater-resistant steel-cutting carbide tool material. Write for Price List No. 7 containing new low prices effective Jan. 5, 1942, and for Catalog No. 42.

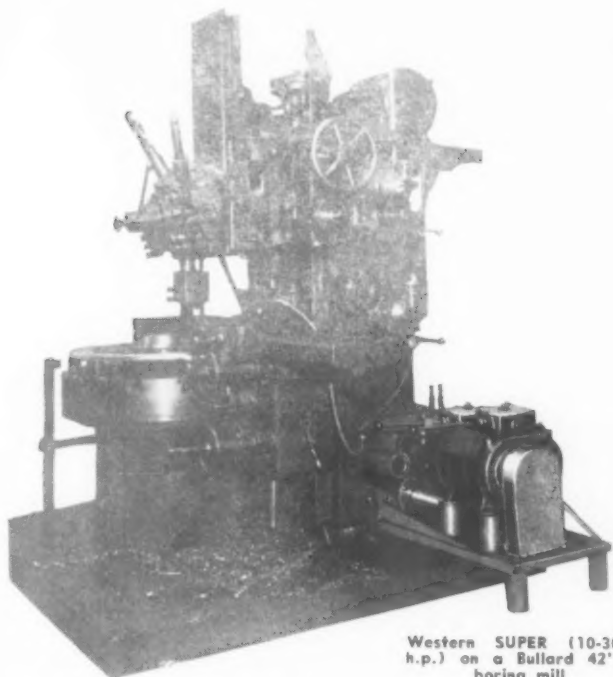
SALES REPRESENTATIVES FROM COAST TO COAST



## McKENNA METALS Co.

600 LLOYD AVE., LATROBE, PA.

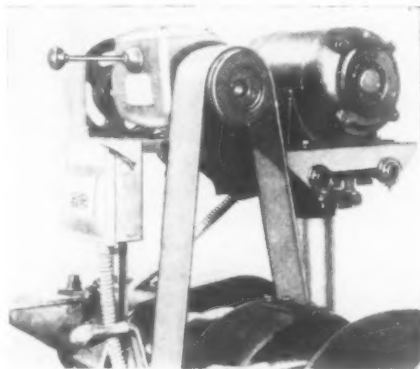
Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York  
(Exclusive of Canada and Great Britain)



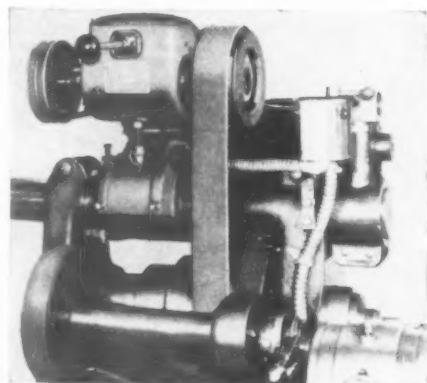
Western SUPER (10-30 h.p.) on a Bullard 42" boring mill.

## New Models WESTERN TRANSMISSIONS

A MASTER capacity (1-5 h.p.); A MAJOR capacity (5-10 h.p.) and A SUPER (10-30 h.p.) can be installed on shapers, radials, slotters, boring mills, gear cutters, die sinkers, etc. Transmission case and cover are of semi-steel castings and are oil-leak proof. The gears and splined shaft are of alloy steel, accurately machined, heat treated and ground—the gears are lapped. Standard bracket for transmission and motor mounting is furnished and also an adjusting belt.



Western MASTER (1-5 h.p.) on a Warner-Swasey turret lathe.

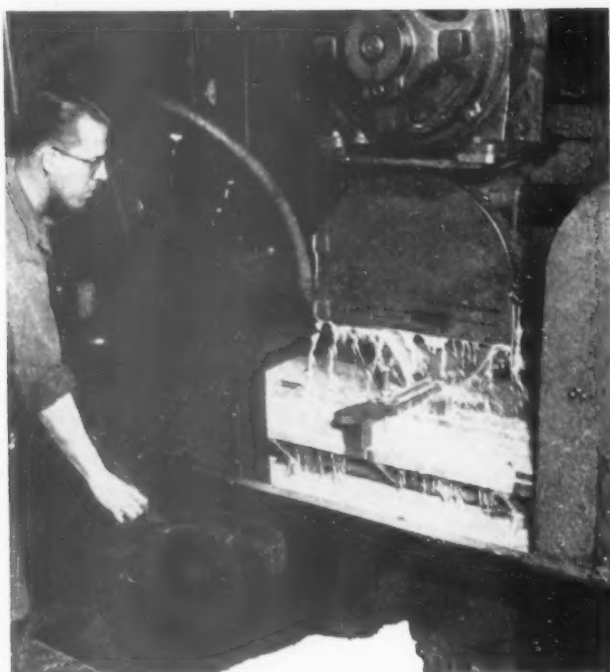


Western MASTER (1-5 h.p.) on a Cincinnati No. 2 milling machine.

Send for catalog and complete information.

**WESTERN MANUFACTURING COMPANY**  
3406 Scotten Ave. Detroit, Michigan

MARCH, 1942



ANDREW C. CAMPBELL  
NO. 302 HORIZONTAL,  
WET ABRASIVE  
CUT-OFF MACHINE

"all types of iron and steel can be sectioned without burning or checking the surface"

## ... FOR LONG CUTS THROUGH SLAB OR FLAT STOCK

The CAMPBELL No. 302 fills the need for a machine that will make top quality long cuts through flat or slab stock at production speed.

It is illustrated above in a plant where they use it on heat-resistant alloy steels, Hadfield's manganese steel, abrasion-resistant irons and alloy white cast iron with BHN of approximately 700 ... Their chief metallurgist says, "Our experience (with it) shows that all types of iron and steel can be sectioned without burning or checking the surface."

The CAMPBELL No. 302 works equally well on steel, glass, porcelain, brick and stone, eliminating most of the operations needed to finish-off cuts made by other methods.

No. 302 is but one of the many CAMPBELL ABRASIVE CUTTING MACHINES. Whatever you are cutting—bar stock up to 6", tubing, irregular shapes, slabs—ask to have a Campbell Engineer study the operations, without obligation.

**AMONG THE MANY WAR PRODUCTION JOBS CUT ON CAMPBELL MACHINES**  
Parts for Aircraft; Aircraft Engines; Propellers; Army Trucks; Cars and Tanks; Machine guns; Bombs and Shells; Small Arms Ammunition; Projectiles; Field Telephones.

ANDREW C. CAMPBELL DIVISION • BRIDGEPORT, CONN.

*Campbell*  
**ABRASIVE CUTTING MACHINES**

**AMERICAN CHAIN & CABLE COMPANY, INC.**  
BRIDGEPORT, CONNECTICUT

phasized that "plastics are here to stay, and are a definite part of our present and future economic life." Mr. Frommelt had with him various samples of very intricate plastic products, made by different industries throughout the U.S.

The meeting was well attended, and a great deal of interest was shown in the topic presented to the group. The Society was sorry to learn that Mr. G. A. Smart, a former president of the Milwaukee group and former Vice-President of the National Society, is in the

hospital for an examination and physical checkup.

The annual election of officers was held and the following were elected to these offices:

Chairman—Julius Reidl  
V. Chairman—William Iekel  
Secretary—Otto Wernicke  
Treasurer—Roland Nauertz.

#### Tri-Cities (Moline)

The Tri-Cities Chapter held its monthly meeting on Wednesday, Feb.

4, at 6:30 p.m. at the Blackhawk Hotel, Davenport, Iowa. Mr. S. G. Lunde was elected Chairman of the Tri-Cities Chapter at a dinner meeting in the Empire Room of the Blackhawk Hotel. The retiring Chairman is W. Z. Fidler. Other officers elected to serve with Mr. Lunde and who will be installed at the March meeting of the Society with him are:

1st V. Chairman—F. J. Siebenmann  
2nd V. Chairman—T. L. Ramsey  
Secretary—L. J. Rodgers  
Treasurer—E. W. Peterson.

Following the election, a resolution was read extending the sympathy of the Society to Mrs. Morgenthall, widow of Joseph B. Morgenthall, Past Chairman, who recently passed away. Speakers for the technical session were Mr. A. J. Scheid, representing the Columbia Tool Steel Company and Dr. H. A. Frommelt of the Kearney & Trecker Corporation.

Mr. Scheid presented a movie in colors, showing various operations in the process of manufacturing tool steel from the melting of the raw material to the finished product. The use of power hammers in forming 3000 lb. steel ingots, as well as smaller hammers forming square and hexagonal bar stock, was illustrated in detail, and the skill needed by the operators was clearly demonstrated. Dr. Frommelt illustrated his discussion of milling operations with motion pictures and slides in colors. These operations were presented in the nature of problems in design of fixtures for holding the parts to be machined and in proper methods for arranging and feeding of cutters. Of particularly popular interest at the present time were pictures of milling operations being performed on parts for 37 millimeter anti-tank guns and on parts for governors of submarine engines.

#### Peoria

The Peoria Chapter held its regular meeting on Tuesday evening, February 3, in the Creve Coeur Club. After dinner, Mr. John B. O'Connor, V. P. in Charge of Development and Engineering, Lyon Metal Products, Inc., spoke on "Planning and Production Scheduling." Mr. O'Connor outlined carefully and clearly the scheduling procedure of his company, beginning with the sales forecast and ending with the finished product.

Following the talk, a very worth while movie entitled "Principles of Motion Economy as Applied to Tools and Machine Tools" was presented by the Saginaw Steering Gear Div. of General Motors. This was a color film showing how the motions of the operator in many

Typical parts made of Ampco Metal shown at right.



Longer service life of machine parts becomes imperative when a war production line may depend upon the smooth functioning of a machine tool. Today, many vital frictional parts have been redesigned to include Ampco Metal, an alloy of the aluminum bronze class, because of its marked wear-resistance.

#### Wears 5 to 15 times longer

Actual installation tests prove that Ampco Metal has from five to fifteen times the life of ordinary bronzes. Today, as never before, such a metal appeals to production-conscious designing engineers as essential to continuous production. Many machine tool manufacturers have more than forty Ampco applications in their line of tools.

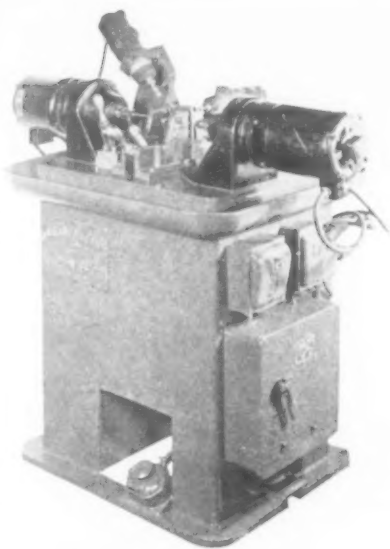
Not only machine tools, but aircraft, ordnance, heavy machinery, and other important war equipment include parts of Ampco bronzes. Ampco engineers are at your service. Ask for Catalog No. 22.

**AMPCO METAL, INC.**  
Department TE-3 MILWAUKEE, WIS.

#### AMPCO LITERATURE Available

AMPCO METAL, catalogue 22  
Ampco—Industrial Bronzes Catalogue  
Ampco-Trode Coated Aluminum Bronze Welding Rod  
Ampco Metal in Machine Tools  
Ampco Metal in Bushings and Bearings  
Ampco Metal in Dies  
Ampco Metal in Acid-Resistant Service  
Ampco Metal in Aircraft  
Ampco Metal Centrifugal Castings  
Ampco Metal in Heavy Machinery  
Ampco Metal in Gears





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INCORPORATING  
**GOVRO-NELSON**  
CENTRIFUGAL FEED  
AUTOMATIC  
DRILLING UNITS

## COGSDILL BEARING-IZERS FOR BETTER BORES

SUBMIT  
**YOUR**  
HOLE  
PROBLEMS

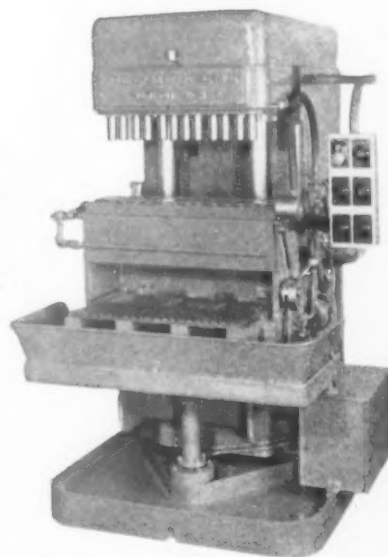


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ENGINEERING SERVICE  
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## SPECIAL SINGLE OR MULTIPLE HORIZONTAL OR VERTICAL SPINDLE MACHINES FOR HOLES

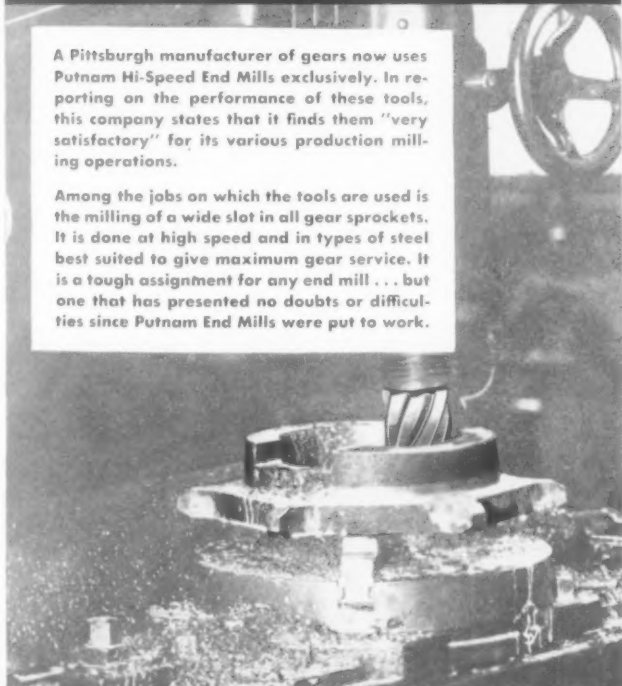


EQUIPMENT FOR HOLES ENGINEERED TO PRODUCT AND PLANT

## "Very Satisfactory" For Milling Toughest Gear Steels

A Pittsburgh manufacturer of gears now uses Putnam Hi-Speed End Mills exclusively. In reporting on the performance of these tools, this company states that it finds them "very satisfactory" for its various production milling operations.

Among the jobs on which the tools are used is the milling of a wide slot in all gear sprockets. It is done at high speed and in types of steel best suited to give maximum gear service. It is a tough assignment for any end mill... but one that has presented no doubts or difficulties since Putnam End Mills were put to work.



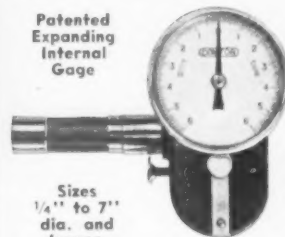
**PUTNAM TOOL COMPANY**  
2987 Charlevoix Ave. • Detroit, Michigan

"This stuff is coming a lot better since we gave the operators those Comtorplugs!"



The greenest operator can gage bores 100% accurately with **COMTORPLUG** to a fraction of .0001".

Patented  
Expanding  
Internal  
Gage



Sizes  
1/4" to 7"  
dia. and  
larger

Because it is so **DEPENDABLY** accurate, Comtorplug is widely used by shop and government inspectors on precision bores. Because it is so **AUTOMATICALLY** accurate, Comtorplug is widely used **AT THE MACHINES** producing those bores. Comtorplug cuts down rejects—and often makes possible the narrowing of tolerances—because it enables the greenest operator to accurately measure size, and to detect out-of-round, front or back taper, barrel shape, bell mouth, etc. to a fraction of a ten-thousandth. Fast, rugged, automatically accurate, this "Brings Laboratory Accuracy to Production Gaging". All sizes of plug fit the same amplifier.

Request Bulletin 27

**THE COMTOR CO.**  
70 Rumford Ave.  
Waltham, Mass.

instances have been simplified by mechanical improvements, with subsequent increases in production.

Another feature of the meeting was the election of officers at which Carl A. Holmer was elected Chairman, Levi W. Hammond, 1st Vice-Chairman; J. H. Benedict, 2nd Vice-Chairman; John L. Ritschel, Secretary; and Ben Hartsock, treasurer.

### Philadelphia

The regular monthly meeting of the

A.S.T.E. was held on Thursday, February 5, at the Engineers Club of Phila.

The meeting was called to order by Chairman, Mr. McMonagle, who, in turn, turned it over to Mr. Crook, V. Chairman. Mr. Crook introduced the speaker of the evening, Dr. John Gailard, who spoke on "The Tool Engineers' job in Company Organization."

Following the technical session the meeting was turned over to Mr. McMonagle, who appointed Thomas J. Donovan as Chairman of the Election Com-

mittee. Mr. Donovan appointed two tellers to collect the votes for the various offices that were open. The election of officers followed with sixty members present eligible to vote. The results were as follows:

Chairman—Charles Crook, Jr.  
1st V. Chairman—Fred Creager  
2nd V. Chairman—Henry Simpson  
Secretary—Foster Crayton  
Treasurer—Howard Cross.

### Pittsburgh

The February meeting of the Pittsburgh Chapter was held at McCann's Restaurant in Pittsburgh on Friday evening, Feb. 6. After a very enjoyable dinner, those members present held a short business meeting at which reports were submitted by various committee chairmen, and also the election of officers for the ensuing year took place, with the following results:

Chairman—William Owen  
1st V. Chairman—Gardiner Young  
2nd V. Chairman—W. V. Miller  
Secretary—Gus Kronfeld  
Treasurer—C. E. V. Brickner.

The Membership Committee reported that it had sent in 37 applications with 35 being accepted. They also promised to make a land slide for the next meeting. Mr. Miller moved that the members and committee have a three hundred membership for Mr. Frank Curtis' visit in March. The motion was seconded and carried.

Following the business meeting, Mr. John Haydock, Managing Editor of American Machinist spoke on the subject of machine tools in defense industries. His talk, which was well illustrated with slides of the machines spoken about, was a very timely and interesting one to all members present.

### Rochester

The Rochester Chapter joined with the Industrial Management group of the Chamber of Commerce and the American Society for Metals on the evening of February 9 at the Chamber of Commerce headquarters.

Chairman Ralph Ekberg, Kodak Park, head of the Industrial Management group, introduced Roy Lusink, Chairman of the A.S.M. who in turn introduced the speaker of the evening.

Dr. Paul G. Faragher of the Aluminum Company of America gave a mighty interesting talk on aluminum. The problem of making aluminum, more aluminum, doubling it, and then tripling it was the forceful way Dr. Faragher described the Aluminum Company's production problem. Aluminum as one of the earth's most abundant ele-



**LIMA GEARSHIFT DRIVES FOR ALL TYPES OF MACHINE TOOLS**

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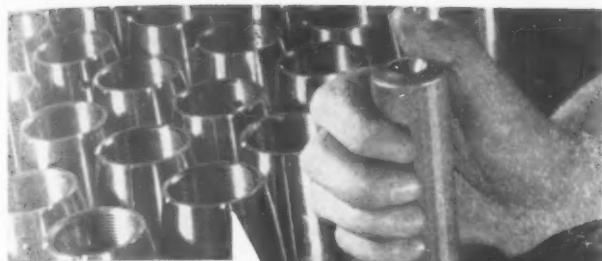
**THE LIMA ELECTRIC MOTOR COMPANY**

Builders of Industrial Motors — Lima Gearshift Drives

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**LIMA, O. ENGINEERED PERFORMANCE U. S. A.**

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## ON THE NOSE!



Since Taft-Peirce first provided the gages for the original educational shell orders, the capacity of the Taft-Peirce Gage Division has doubled, redoubled, and still continues to grow. Today, throughout the defense industries, costly errors are being avoided, precious time is being saved, accurate size-control of production is being maintained with Taft-Peirce Gages and Gaging Fixtures. One of the few



complete gaging systems, the Taft-Peirce line includes all standard types. Any special types may be produced as ordered. For the full picture, write on your letterhead for a copy of the Taft-Peirce Handbook.

The Taft-Peirce Mfg. Co., Woonsocket, R. I.

## Why Worry . . . . about delivery dates on New Tools?

### HARD Chromium



### Makes Old Tools Better than New

Your old drills, arbors, reamers, etc. will be BETTER than new when worn surfaces are built up with Hard Chromium by our plating process, developed in our own research department for utmost control of adhesion and hardness. We have the experience and equipment to do your work promptly.

Besides great resistance to heat, wear, erosion and most kinds of corrosion, our Hard Chromium has low coefficient of friction under severe pressures—especially valuable for dies and other forming tools. Heat treatment can be simplified and distortion minimized. Send for our 10-minute booklet telling where to use Hard Chromium and what to expect from it.

Racine Plating Co., Inc., Racine, Wis.

Hard and Bright Chromium, Copper, Nickel and Cadmium Plating: Oxidizing, Pickling, Polishing.

MARCH, 1942

## Choose GOLCONA SHAPED DIAMOND TOOLS



### for Precision Radius, Gear and Thread Grinding

Golconda engineers developed a special forged setting that makes practically impossible loosening of the selected long, clear diamonds used for GOLCONA tools. This process also allows the diamond to be shaped to its angulation after setting—another indication of GOLCONA outstanding engineering superiority.

Available in approximately 60°, 75°, 90° and 120° angles—with needle sharp points if necessary. Write for Literature, Prices and Quantity Discounts.

We also make SINGLEPOINT and POLYPOINT Diamond Tools for cylindrical, surface and centerless dressing.

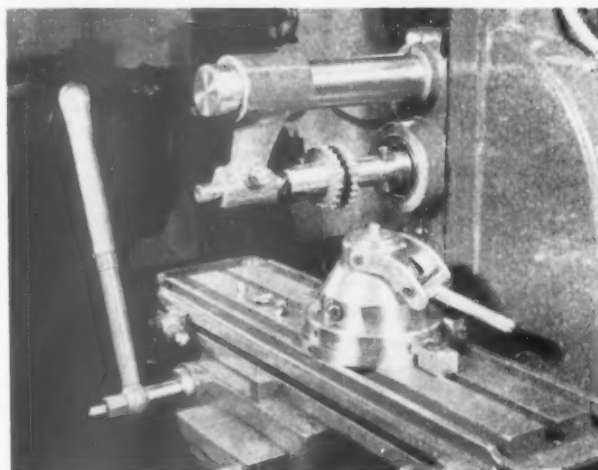
## GOLCONDA

DIAMOND PRODUCTS CORPORATION

2212-16 West Armitage Ave.

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## NEW COLLET INDEX FIXTURE



### FOR RAPID PRODUCTION ON SECOND OPERATION WORK . . .

Mounts on face plates or tables and has wide application on milling machines, lathes, internal grinders, external grinders, drill presses, gear shapers and screw machines. Accuracy guaranteed. All parts hardened and ground.

Two sizes—1" and 2". Standard W. & S. Collets or can be furnished to fit customer's Collets.

Write For Complete Information

## ZAGAR TOOL, INC.

23880 Lakeland Boulevard, Cleveland, Ohio

ments was described as a strange fellow because of his tenacious friendship with other elements. The problem of breaking up this friendship, that is, producing pure aluminum is and always has been a most difficult procedure. The reduction of bauxite to aluminum oxide and then the electro-chemical tri-alite medium made a very interesting talk by Dr. Faragher.

To top off the evening, the Aluminum Company's motion picture showing the processing of its product, fabricating of

the same and the many uses it is put to gave all present at least a slight conception of the importance of this element—Aluminum, in the defense and industrial program.

#### Rockford

The Rockford Chapter held its monthly meeting on Feb. 5 at Hotel Faust. This was the annual joint meeting of the Rock River Valley Engineering Council and Rockford Industrial Marketers with the American Society of

Tool Engineers Chapter of Rockford.

Mr. Kenneth Lund, the Tool Engineers representative on the Rock River Valley Engineering Council had charge of the meeting.

The group was very pleasantly surprised with a short after dinner talk by Mr. J. G. Gilbert Lodge, Governing Director of Gilbert Lodge Company, Ltd., London, Australia, and New Zealand. Mr. Lodge is the only member of the A.S.T.E. in Australia, and he reported that despite his fears of an invasion attempt by Japan directed at Australia, the war will be over by the end of 1943 and that the Allies will be victors. From comparative figures of available raw materials in Germany and Japan, Mr. Lodge believes that both countries could not stand a war five years. Raw materials will be the greatest problem for the Axis nations, he predicted.

Mr. Joseph Geschelin, Detroit Editor of the Automotive Industries, was the principal speaker. Mr. Geschelin outlined very completely the part the automotive industry is playing in the defense program. Following his visit to several aircraft manufacturers plants in California, he predicted that America will have an air industry of the kind we have never had before. He also stated that we will see planes developed as bombers converted for transportation of freight and express and that there will be lower priced mass production of planes for private flying.

Mr. Geschelin pictured the future automobile with motors in the rear, luggage carrier and tire rack in front, and the design will produce a light and small but powerful and economical automobile. The machine tool industry will have a vital role after the war is over, just as it is playing a vital role in the war effort, Geschelin declared. Tools will have been in use 24 hours a day, 7 days a week during the war period, and many of the tools will have worn out or become antiquated; therefore, the industry will need replacements when peace returns.

A brief separate meeting was held by the members of the Rockford Chapter to elect officers for the 1942 and 1943 season, which resulted as follows:

Chairman—Fred Kampmeier  
1st Co-Chairman—Leo Reuland  
2nd Co-Chairman—Roy E. Dreyer  
3rd Co-Chairman—Fred Swanson  
Secretary—E. A. Norrman  
Treasurer—Walter Lustig.

The new officers will be installed at the April meeting.

#### St. Louis

The St. Louis Chapter convened at

THE TOOL ENGINEER

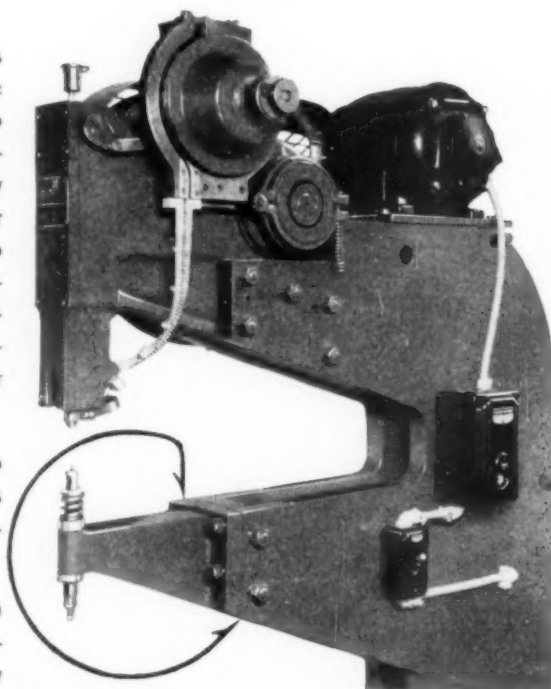
## 1" DIA. SOLID STEEL RIVETS

### 4 automatically fed and set at rates averaging 1600 per hour

Not only does this RIVITOR handle the 1/4" rivets but also (with different tooling) as efficiently handles the lighter riveting down to 1/16" diameter rivets. This greater capacity meets requirements of a greater number of jobs.

Work requiring up to 36" throat depths can be accommodated.

The detachable horn permits simple application of a variety of lower tooling designs. This machine's sturdy, rugged construction throughout provides, with minor replacements, its extended life to make full use of its versatility for riveting production now and from (practically) now on.



## "RS" RIVITOR

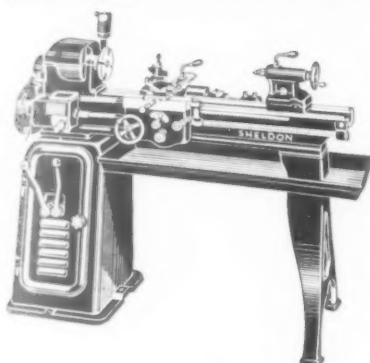
The average rate of 1600 rivets set per hour may be raised or in some cases lowered depending on the ease with which the work can be handled. The riveting stroke is made at the rate of 190 per minute (flywheel speed).

write for Bulletin R-4

THE TOMKINS-JOHNSON CO., 624 N. Mechanic Street, Jackson, Michigan

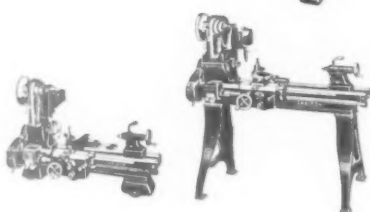
this is a **TOMKINS-JOHNSON** product

## SHELDON Back Geared Screw Cutting PRECISION LATHES



### For the Tool Room

The finest 10", 11" and 12" lathes ever built in the moderate price field. Large special analysis steel spindles GROUND ALL OVER, with extra collet capacity. Hand-scraped Bronze, Ultra-Precision Ball or Super Precision Roller spindle bearings, (the finest bearings obtainable). Heavy braced, semi-steel beds with hand scraped ways (2 V-ways and 2 flat ways) These lathes come with a choice of aprons, gear boxes, and drives including the anti-friction, 4-speed, V-belt Lever-operated pedestal base motor drive illustrated. Telescopic Taper Attachment and other accessories available.



### For Production

Sheldon Lathes will stand up to any production work within their capacity—are ideal for second operation work. Production models available with any or all of these features: Ultra-Precision Ball or Super-Precision Roller spindle bearings, Lever-operated Collet Attachment, Lever-operated Tail Stock, Lever-operated cross slide with double tool post, Lever-operated turret, etc.

### For Machine Shop

Both Bench and floor models with choice of Semi-quick or Full-quick Change Gears, Plain Aprons or Worm Feed Apron with Power Cross Feed, Overhead, Back or Underneath Motor Drives—Telescopic Taper Attachments, Tool Post Grinders, Milling attachments and all standard accessories.

Write for Catalog and name of nearest distributor.

**SHELDON MACHINE CO., INC.**

4252 N. KNOX AVE.

CHICAGO, U.S.A.

## SHELL MARKING MACHINE ...for Marking 20MM to 155MM Shells

### High Speed Production



No. 79  
MODEL



Designed for high speed production marking, this machine is made in four sizes ...marks from 10 to 40 shells a minute, depending on size. Aside from manual feed, the machine is entirely automatic in marking and ejecting shells.

The close up illustrated above, shows the marking dies and type in holder, which is quickly changed for various marking. Write for full information and prices today.

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MARCH, 1942

## Streamlined

### IN APPEARANCE and PERFORMANCE



### this NEW WILTON PRECISION VISE

WRITE  
for folder  
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INDESTRUCTIBLE  
FULLY ENCLOSED SPINDLE  
NO DEAD MOTION  
VIBRATION PROOF  
GREATER HOLDING POWER  
Low Priced and Guaranteed for One Year

**WILTON TOOL CORPORATION**

936 WRIGHTWOOD AVE.

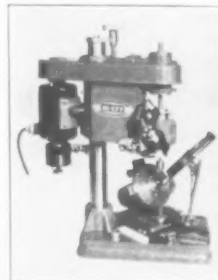
CHICAGO, ILLINOIS

## Sensitive Drilling Machines

New "B" Series "HI-EFF" Heavy Duty, Ball Bearing, Sensitive Drilling Machine, available in five capacities, drills holes from .01 to 5/8 inch is illustrated at the right. Speed ranges of 750 to 4000 R.P.M. are standard and 1500 to 8000 R.P.M. are available. Constant spindle speeds are assured by "V" belt drive. Available with either bench or floor mounting.



The smaller "A" Series "HI-EFF" Super-Accurate Drilling Machine capable of drilling down to .002 inch diameter (illustrated below) has speed variations by 100 R.P.M., providing maximum life because of proper selection of speed to suit each combination of material and hole size. Speeds to 10,000 R.P.M. are standard and speeds to 40,000 R.P.M. are available.



A Universal Dividing Head is regularly available for the "A" Series Machines.

Taylor products also include Hydraulic Dynamometers and Static Balancing Machines.

**TAYLOR MANUFACTURING COMPANY**

3056 W. MEINECKE AVE.

MILWAUKEE, WIS.

the Melbourne Hotel Thursday evening, February 12. With Doug. Burnside out of the city, Charles Sinning took over as Chairman. The heavy end of the business meeting was the election of officers and when the balloting was over, the following officers were elected: Chairman, Clarence Miller; 1st Vice Chairman, Ernie Nieman; 2nd Vice Chairman, Fred Meyer; Secretary, Walter Powell; and Treasurer, Walter Schwartzkopf.

The Technical Session was capably handled by Carroll Edgar, Chief Tool

Development Engineer for Vascaloy-Ramet, and also H. B. Clark, Sales Manager of Vascaloy-Ramet Corporation. When the members left the meeting, they certainly knew more about carbides than they did when they arrived.

#### Golden Gate (San Francisco)

The Golden Gate Chapter held its monthly meeting on Tuesday, February 10. Seventy-five attended the dinner and meeting. Yearly election of officers was held and the following are

the men elected to office:

Chairman—Walter Kassebohm  
V. Chairman—Harold Wolpman  
Secretary—L. A. Talamini  
Treasurer—Fred N. Kruse.

Following the election of officers, a techni-colored, talking picture entitled "Heat Treating Hints" was shown. This picture was made available by the Lindberg Engr. Company, Chicago, Ill. The subject was interestingly presented and was very informative. After the picture questions pertaining to heat treating were answered by Mr. George Lavey from the Industrial Steel Treating Company of Oakland.

#### Schenectady

The Schenectady Chapter held its monthly meeting at "Ten-O-One" Veteran's Memorial Hall, Scotia, N. Y., on Wednesday evening, February 11.

Chairman A. Schuneman called the meeting to order. Election of officers took place, resulting as follows:

Chairman—H. Crump  
1st V. Chairman—J. L. Tocher  
2nd V. Chairman—C. E. Smart  
3rd V. Chairman—F. R. Linehan  
Secretary—N. Y. Cox  
Treasurer—R. H. Wilke.

Mr. Schuneman then introduced Mr. J. E. Erb, Metallurgist of the Schenectady Works Laboratory of the General Electric Company, who spoke on the "Heat Treatment of Steel." Mr. Erb started his talk by drawing a comparison between steel and concrete referring to steel as a metallic concrete made up of pure iron and iron carbide. Mr. Erb explained the theory of heat treatment of steel both from the theoretical and practical standpoint. He pointed out the various compositions of steel, the effects that can be obtained through heat treatment, and also the theoretical and practical effect brought about by various alloying elements. Mr. Erb concluded his talk by stressing the fact that the hardness of any steel is dependent upon two factors namely, composition and heat treatment. Mr. Erb then presented a very interesting motion picture in both sound and color produced by the Lindberg Engr. Company covering many practical hints and successful heat treating methods.

#### South Bend

On February 10th South Bend Chapter of the A.S.T.E. held its regular monthly meeting at the Indiana Club.

The principal speaker of the evening was Mr. Peter Rossman, Research and Development Engr., Curtiss-Wright Corporation, Airplane Division, Buffalo, N. Y. Mr. Rossman's talk on "Dies and



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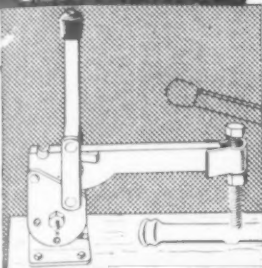
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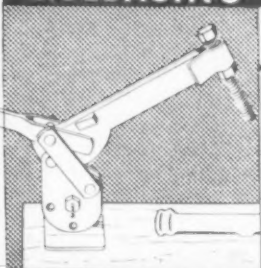


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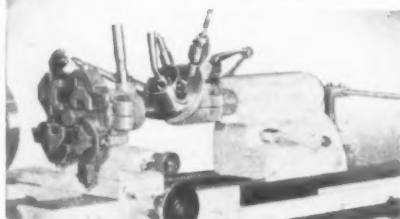
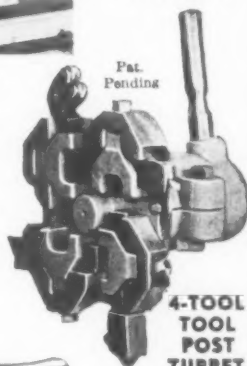


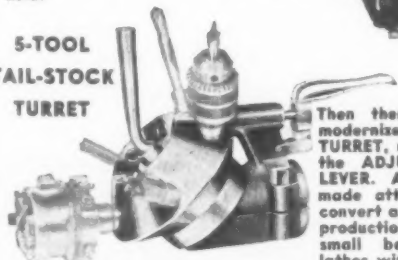
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Tools for Making Airplane Stampings" was very interesting and was illustrated with slides, and motion pictures. The sound movie film entitled, "Curtiss Answers the Call for Quantity", was a tour of their Plant No. 1 in Buffalo, showing the production of P-40 and ended with flight views of the finished product. This was an exceptionally good film.

The election of officers for the new term was conducted by Chairman, Horace R. Wentzell, and the results were as follows:

Chairman—Stanley R. Cope

V. Chairman—Glave S. Bunch, Jr.  
Secretary—Robert Huckins  
Treasurer—Clarence Paden  
2nd V. President—Fred S. Burnside.

### Syracuse

Another active year under the leadership of Chairman Ray Adams has almost passed. At the monthly meeting on Tuesday, Feb. 10, election of Chapter officers for the next term resulted in the choice of Clayt Ainsley for Chairman, Steve Urban for Vice Chairman, John Moffitt for 2nd Vice Chairman, Len

Smith for Treasurer, and Ray Coseo for Secretary.

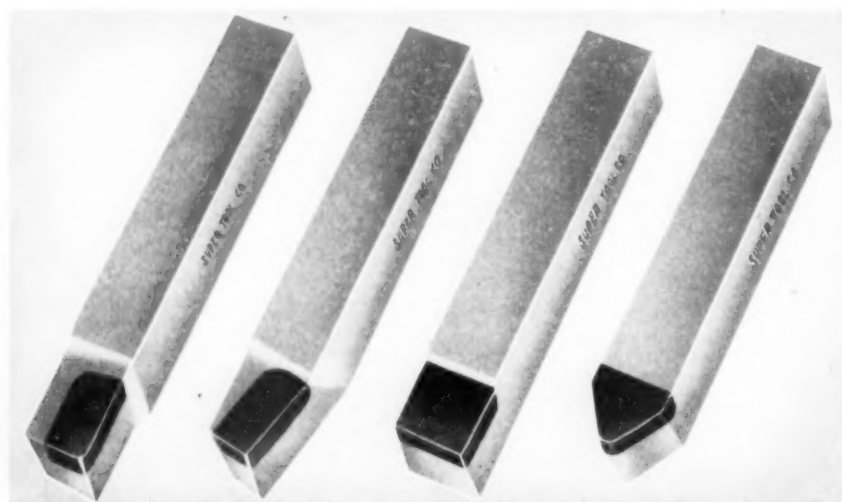
During the meeting on Tuesday, a telegram was received by the Chapter from Second Vice President, Ray H. Morris, of the National Society congratulating both newly elected officers for their success and the losing candidates for a good try. This thoughtfulness by Ray Morris was very much appreciated. Those who failed to attend the dinner and monthly meeting on February 10 missed both the election which was conducted and the informative technical talks. A concert of symphony music and songs entertained members who were present for the dinner. The technical speaker for the meeting was Mr. M. F. Judkins, Chief Engr. of Firthite Division of Firth Sterling Steel Company, who explained the latest developments, uses, and the important field of sintered carbides. In both the talk and question period, specific examples of jobs with production figures were cited. Applications of turning tools and milling cutters in armament manufacture were explained. Recommended grades for various operations and grinding methods also were discussed.

In addition to the address by Mr. Judkins, the Chapter was shown a sound film on The Uses and Abuses of Twist Drills through the courtesy of G. A. Burkhardt of the Cleveland Twist Drill Co. As has been the custom of the Syracuse Chapter since its charter four years ago, the members held a Valentine dinner dance on Friday, Feb. 13, at the Drumlins Country Club. On this occasion the ladies are rewarded for the nights out permitted the boys each month for the regular meetings. A floor show furnished entertainment after the dinner. There were dance routines, songs, juggling acts, and music. After this, dancing and cocktails, completed the program.

### Toronto

In honor of the visit of national president Frank W. Curtis, and in view of the coincidental presence in Toronto of deputy machine tools controller Roy Wise, an ante-meeting was held to bring these two guests, the guest speaker Ben Berlien of Lindberg Engineering Co., Chicago, and the outgoing executives together.

There were 90 at dinner, and president Frank Curtis made a short address to the meeting, announcing that by the 10th anniversary of A.S.T.E., to be held in St. Louis, the society would probably have 53 chapters. The chartering of Montreal Chapter No. 50 brings the total membership well over 9,100 and immediate plans were to open No. 51



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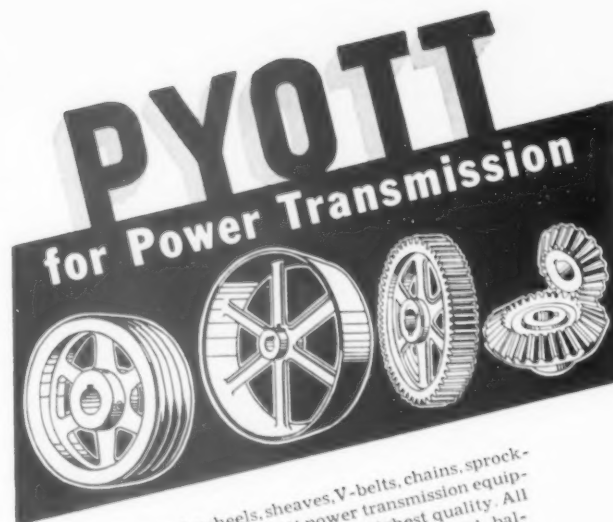


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## A. S. T. E. DOINGS

Chapter in Dallas, Texas, No. 52 in Wichita, Kans., and probably No. 53 in Providence, R. I.

Said president Frank, "We get out of our chapters just what we put into them. This war will be won on the the production line, and every possible effort must be put into machine tools, fixtures, gaging methods—and for all these, tool engineering is the mother industry."

Chairman of Toronto Chapter No. 26 for 1942 is E. N. Wearn, former second vice-chairman Fred Schytte, becomes



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... have read and re-read the book. Became absorbed in finding out and learning so many things I never knew before. Chapter 17 on quenching is worth the price of the book ... will need 45 copies for classroom use.

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first vice-chairman, and is succeeded in his earlier position by Jim McRae. Treasurer Bob Bruce, and secretary L. G. Singer, retained their positions of the year before.

The Speaker of the evening was Ben Berlien, of Lindberg Engineering Co. who paid tribute to the memory of A. N. Lindberg, president of the company, who passed away the week before.

The Lindberg color-sound moving picture clipping on heat treating combines an entertaining frame of mind with very practical suggestions as to methods of handling work into and out of the furnace, and of protecting tricky shapes from distortion and packing.

Mr. Berlien pointed out that the intelligent study of heat treating by societies such as A.S.T.E. and others has changed the subject from a "backroom art" to a true science of enormously enhanced value.

### Williamsport

The Williamsport Chapter held its meeting at the Y.W.C.A. on February 9.

The meeting was brought to order by the Chairman, who at that time devoted a few minutes to welcoming and introducing guests, new and prospective. The charter was then closed with a membership of 105. This announcement was given a good hand by all present.

After proper discussion, Mr. Lester Lantz was elected First Vice-Chairman, and Mr. Baldo Shipman was elected Second Vice-Chairman. Committees were appointed and their chairmen as follows:

Chairman of Membership Committee  
—Don Lowrey  
Chairman of Entertainment Committee—Claude Towar  
Chairman of Publicity Committee—Clifford Zweier  
Chairman of Editorial Committee—Harry Taylor  
Chairman of By Laws—Merrill Bradley

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Chairman of Standards & Data—Henry Pfefferle.

The membership voted that the name of the Chapter shall be "The Williamsport" Chapter and that meetings shall be held on the second Monday of each month.

### Worcester

The Worcester Chapter held its February meeting on the 9th. This was one of the coldest evenings of the season, and apparently Charlie Banks had trouble getting his car started because

he did not come in until just when the meeting started. Many of the boys were working until eight or nine o'clock at night but came down after the dinner.

The Chapter meeting was honored by the presence of two members of the Boston Chapter, namely, Mr. Robertson and Mr. Ted Drowns and Mr. Bohlin from the Hartford Chapter.

The business meeting started with Mr. Aldrich reading the treasurer's report that showed that they had some cash on hand. Mr. Lindegren, Chairman, told about the tenth anniversary

coming in March and that they hope to get 10,000 members by that time and that they all will have to dig in and try to reach that goal. Mr. Banks, Secretary, read his report and announced about the meeting which would take place in St. Louis on March 26, 27, and 28. The election of Officers then took place, resulting as follows:

Chairman—Mr. Goff

V. Chairman—Mr. Chester Bath

Treasurer—Mr. Herbert Ramsdell

Secretary—Mr. Harvey Allison.

The members appreciated the work put in by Messrs. Lindegren, Goff, Banks, and Aldrich, and the Nominating Committee endeavored to have Mr. Banks and Mr. Aldrich continue with their work, but they stated that they felt that they had served their time and would like to have some other members take over.

Mr. Goff then introduced Mr. Harold Burke, Chief Tool Designer of the Worcester Pressed Steel Company, who spoke on drawing dies and the sheet metal industry. Mr. Burke illustrated his talk with actual samples of stampings and explained in detail some of the problems that occur in deep drawing and also what consideration should be given for stamping. After the talk there were many questions brought up from the floor and it was assured that quite a few of the members obtained some real valuable information. Mr. Goff then introduced Mr. Gus Rehnberg of the Norton Company. Mr. Rehnberg has charge of all the sheet metal work at this company. He showed with actual models, work being done by his department which has eliminated cast steel products, naturally eliminating considerable machining, making a valuable monetary saving and naturally a big time saver.

### Central Pennsylvania (York)

The Central Pennsylvania Chapter held its monthly meeting on January 13.

A short business meeting was held at the home of George Ryder. In the absence of the Chairman, Mr. Ivan Grass, Vice Chairman called the meeting to order.

Under new business, the election of a Chapter Nominating Committee was held. Mr. Otto Novotny, was elected chairman. Others were Mr. Raymond Wentzler and Mr. Horace Wiest.

During the period in which the reports of committees were presented, the Chapter voted to give \$5.00 in Defense Stamps as a door prize at the February meeting.

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- 3 If our records show that you have already received a copy, another will not be sent.
- 4 If you are not a foreman, operator or assistant, but merely interested in this book, send 50c (a fraction of its cost) with your letter. Such orders are not encouraged.
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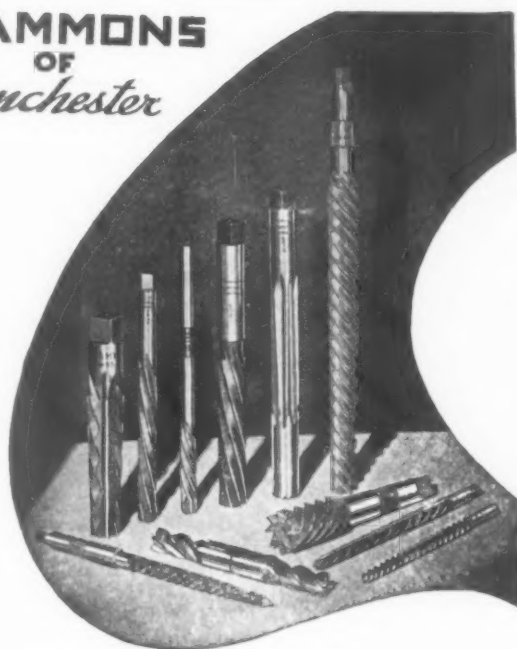
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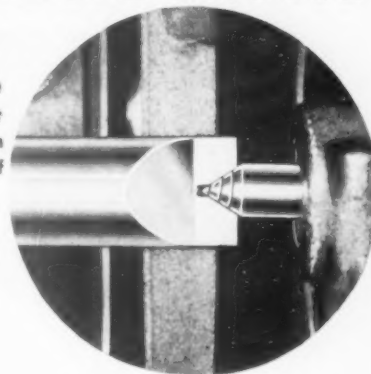
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from

**15 to 1**

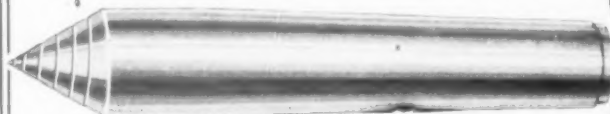
running time over the  
conventional type of  
centers



**ONLY ONE  
APPLICATION  
NEEDED**

CMD Helical groove center  
expels heat from work caused by  
cutting tools — conveys center  
lubricant to extreme point of  
work and center—Lubricates entire  
bearing surface of work and center—  
No stopping of lathe to relubricate  
the center—No readjustment of tail  
stock necessary—No dripping or crushing  
out lubricant—Frictional heats reduced  
—Expansion of work kept at a minimum.

Write for  
Oil sample  
and Bulletin  
TODAY



## CHICAGO MANUFACTURING AND DISTRIBUTING CO.

1943 W. 46th ST., CHICAGO, ILLINOIS

# NEW LITERATURE . . . . .

Of Interest to the Tool Engineer



## (362) Hard Chromium

*A Story About Hard Chromium and Its Application To Modern Metal Fabrication.* 16 pp. Racine Plating Company. The purpose of this booklet is primarily to acquaint tool and machine users with the usefulness of hard chrome. It tells how tools may be salvaged from scrap and how tools and

gauges can be made to stand up much longer when plated.

## (363) Tools and Blanks

*Carboloy Standard Tools and Blanks.* 8 pp. Carboloy Company, Inc. 11145 E. Eight Mile Avenue, Detroit, Michigan. This bulletin covers all styles and types of standard tools offered. It includes

drawings and tables showing major specifications and tool angles, and also includes typical examples showing how these standard tools can be used for special cutting requirements.

## (364) Gear Generators

*Fellows Straight Line Gear Generator.* 12 pp. The Fellows Gear Shaper Company. This booklet tells how the machine is set up for different operations and illustrates each. It goes into detail with gear formulae, charts, and drawings. Also included are the specifications for the generator.

## (365) Straightening Presses

*How to Get Triple Duty From Your Straightening Presses.* 4 pp. The Denison Engineering Company 115 West Chestnut Street, Columbus, Ohio. Illustrations and text of this new folder show how three new functions are performed with standard DLSC2 Denison Straightening Press. The new uses are in assembling, broaching, or bending.

## (366) Electric Tools

*Tools For the Defense of America.* 45 pp. Skilsaw Inc., 5051 Elston Avenue, Chicago, Ill. This catalog describes and illustrates a complete line of electric tools and how they are used. Complete specifications and prices are given.

## (367) Precision Engineering

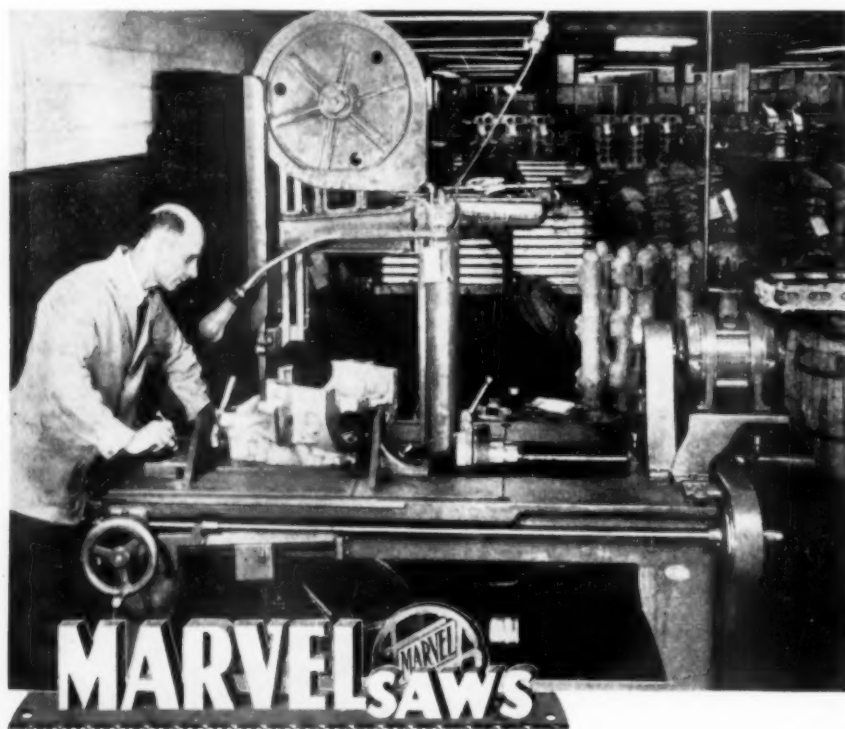
*Where Precision Transcends Every Other Consideration.* 16 pp. Merz Engineering Company. This brochure describes the activities and operations in a precision engineering organization. It is illustrated, with pictures of machines and operations in the production of extremely accurate inspection gauges and instruments that seldom appear in print.

## (368) Grinders

*The Oliver "Arc" Face Mill Grinder.* 8 pp. Oliver Instrument Company, 1440 East Maumee Street, Adrian, Michigan. This folder gives the features of the Oliver grinder along with complete specifications. Grinder and its applications are fully illustrated.

## (369) Turret Lathes

*South Bend No. 2-H Turret Lathe.* 4 pp. South Bend Lathe Works, Dept. T7, South Bend, Indiana. This bulletin is a condensed catalog which may be conveniently filed for reference. In it the newest 2-H turret lathe is fully illustrated. Complete specifications are given



Photograph courtesy Packard Motor Car Co.

## A MARVEL No. 8 Speeds All-out Production of Packard Rolls-Royce Aircraft Engines

MARVEL Sawing Machines are playing an important part in speeding production for National Defense. Not only the MARVEL 6A and 9A High-Speed Production Saws that automatically cut-off rifle barrels, gears and parts from bar stock in great quantities; or the giant MARVEL No. 18 Hydraulic Saw so well known for its cutting Speed; but all other MARVEL Saws, too, each in its own way, are at work in America's "all-out production." Take for example, the MARVEL No. 8 Universal Band Saw illustrated above, working on aircraft engine crankcases in the "D" Division of the new Packard Rolls-Royce Engine Plant.

Because of its large capacity (will handle work up to 18" x 18") because it cuts at any angle from 45° right to 45° left; and because the blade remains vertical throughout its straight-forward carriage travel, the MARVEL No. 8 will do trimming, notching, mitering and cutting-off, and will save hours of machining by roughing out work to size and shape.

Buy from your local distributor.

**ARMSTRONG-BLUM MFG. CO**

"The Hack Saw People"

5700 BLOOMINGDALE AVE.

CHICAGO, U. S. A.

Eastern Sales Offices: 225 Lafayette St., New York

**Having difficulty holding tolerances?**

# DEMAND THE **ZIEGLER**

ROLLER DRIVE  
**Floating Holder**  
for

**Taps and Reamers**

AUTOMATICALLY compensates for machine spindle misalignment, eliminating over-sized or bell-mouthed holes.

Helps produce unbelievable accuracy on both new and old equipment.

Furnished with male or female taper, straight, threaded or special shanks to fit any machine used for tapping or reaming.

**W. M. ZIEGLER TOOL CO.**  
1920 Twelfth Street DETROIT

FLOATS  
R  
A  
D  
I  
A  
L  
L  
Y



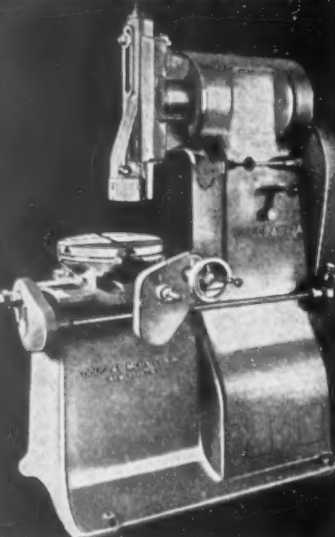
# *Douglas* PRECISION SLOTTER

**FOR TOOLROOM AND PRODUCTION**

Swiveling ram head and tool holder, automatic circular table and independent automatic feeds in all directions.

**Prompt Delivery by Large-Scale Production**

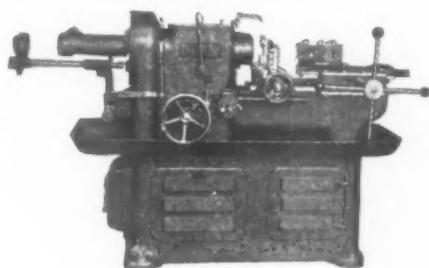
Built with  
7", 8", 10"  
Stroke



**DOUGLAS MACHINERY CO., INC.**  
150 BROADWAY, NEW YORK, N. Y., Dept. 806-5

# **MOREY No. 2G & No. 3 Turret Lathes** Motor Drive INFINITE SPINDLE SPEEDS

Timken Taper Roller Bearings for Main Spindle  
All Others Anti-Friction



	No. 2G	No. 3
SPEEDS from	90 to 1800 R.P.M. or 180 to 3600 R.P.M.	60 to 2100 R.P.M. or 100 to 3600 R.P.M.
CAPACITY	1"x6 1/2" turning length	1 1/2"x9" turning length Made in Plain and Universal Types

Ask for Bulletin No. 629 Ask for Bulletin No. 727

Any spindle speed you want—a direct reading dial shows when you've got it.  
Permits the use of carbide tools for fast cutting.  
Turret clamps and unclamps automatically.  
Equally effective on second operation and chucking work.

**MOREY MACHINERY CO., INC.**  
410 Broome Street New York, N.Y.

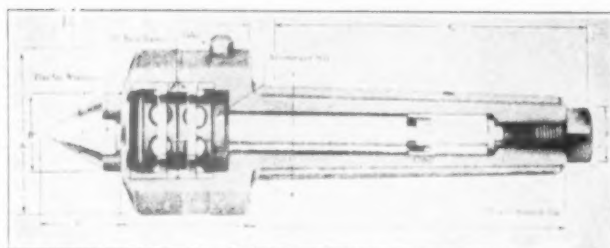
# **The Improved Nielsen Live Centers**

LOAD CAPACITY—200 TO 40,000 LBS.  
AT 100 RPM.

HAVE ADJUSTMENT TO TAKE UP WEAR  
AND PRELOAD BEARINGS

STANDARD MORSE TAPER No. 2 TO 6  
IN STOCK

Write For Catalogue and Discounts



**NIELSEN, INCORPORATED**

LAWTON, MICHIGAN

and construction features are shown.

**(370) Conservation of Alloys**

*Pluramelt Conserves Vital Alloys.* 4 pp. Allegheny Ludlum Steel Corporation. This folder tells you how much stainless you can save behind the surface. It tells you how you can use Pluramelt for conservation of strategic alloys and armoring equipment against corrosion, oxidation, abrasion, or impact.

**(371) Planetary Milling**

*Just Push the Button and Plan-O-*

*Mill.* 6 pp. Gordon-R Company, 627 Washington Square Building Royal Oak, Michigan. Explaining the principles and advantages of planetary milling, this new folder is completely illustrated. It gives the specifications of the Plan-O-Mill and diagrams showing its operation.

**(372) Laminated Shim**

*The Solid Shim That Peels For Adjustment.* 8 pp. Laminated Shim Company, Inc. A new booklet which gives a history of the development of indus-

trial and mechanical applications of the laminated shim since the founding of the company, has just been issued. The booklet describes the use of the shim for fitting of machine parts in original assembly, as well as for making service adjustments.

**(373) Defense Data**

*Defense Data From the Houghton Line.* 31 pp. E. F. Houghton and Company. This booklet gives factual information on metal-working, heat-treating, and machining of armament. This is a fourth of a series of booklets which contains four completely illustrated production stories.

**(374) Tools and Tool Blanks**

*Tantalum-Tungsten Carbide Tools and Blanks.* 26 pp. Vascloy-Ramet Corporation. Listing twenty-two typical styles of single point tools, this new catalog has a grade selector chart recommending the grade of Ramet Carbide for practically every cutting requirement. Included are instructions for ordering tools and blanks, also tables for computing costs.

**(375) Screw Machine Feed Fingers**

*Green Master Feed Finger For Automatic Screw Machines.* 4 pp. Green Manufacturing Company. Illustrating how the master finger with its few inserts provide complete feeding equipment that can be kept in a small space, this folder shows its uses and gives the specifications of the finger.

**(376) Semi-Automatic Lathe**

*Single Spindle Semi-Automatic Machine.* 8 pp. Frankel Machinery Corporation. Type 2 FR Multiple Tool is described by this booklet. How it works, a number of its advantages, the feed, the drive, and the bed are all touched upon in the write-up. It is illustrated and the complete specifications are given.

**(377) Electric Motor Parts**

*Parts For Universal Motors.* 4 pp. Westinghouse Electric and Manufacturing Company, Dept. 7-N-20, East Pittsburgh, Pa. A general discussion in this leaflet includes motor parts of the salient pole non-compensated and the distributed wound compensated types. It covers built-in universal motors for use in drills, screw drivers, and shapers. Numerous photographs make the explanation easy to follow.

**(378) Handee Electric Drill**

*The Artizan.* 64 pp. Chicago Wheel and Manufacturing Co., Chicago, Ill. A very comprehensive booklet showing the 1001 applications of a hand size electric drill in both industry and hobby shop.

**"PUT IT ON THE BLANCHARD"**

**BLANCHARD**

**CHECK THESE ADVANTAGES OF BLANCHARD GRINDING**

- ★ Production
- ★ Adaptability
- ★ Fixture Saving
- ★ Operation Saving
- ★ Material Saving
- ★ Fine Finish
- ★ Flatness
- ★ Close Limits

..... Especially valuable on jobs like the one illustrated.



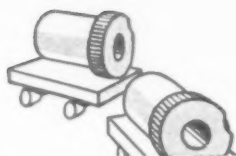
**BLANCHARD GRINDING**  
*also cuts assembly cost*

The speed with which parts can be assembled is a direct reflection of machining operations. All the flat surfaces on the pump parts, shown above, were ground on a Blanchard No. 13 Surface Grinder. This manufacturer is keeping his assembly cost low because the surfaces are flat and parallel and the finish is excellent. The accuracy needed for tight joints and correct alignment is maintained without sacrificing production.

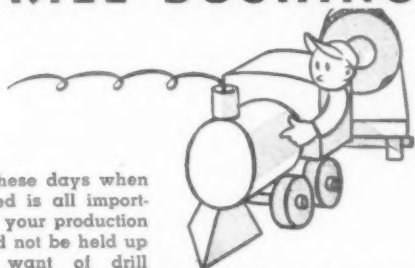
**The BLANCHARD MACHINE COMPANY**  
64 STATE STREET, CAMBRIDGE, MASS.

Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.

*Easy assembly after grinding is another profitable feature of the Blanchard No. 13*



## 3 DAY DELIVERY ON UNIVERSAL DRILL BUSHINGS

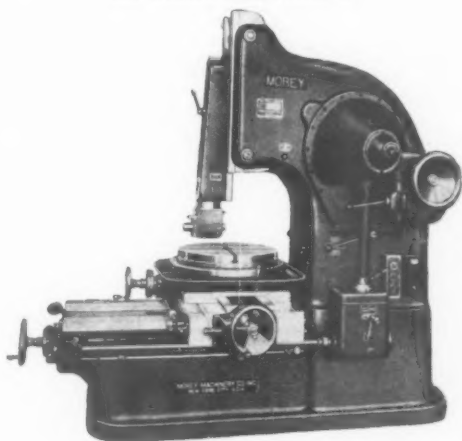


In these days when speed is all important, your production need not be held up for want of drill bushings. For Universal drill bushings in all standard sizes (not special sizes) are now available on a 3-day delivery schedule. With super-finished bores, straight and round within .0001, Universal drill bushings assure accuracy and unexcelled wearing qualities. Write today for further facts and prices.

**UNIVERSAL ENGINEERING CO.**  
FRANKENMUTH • MICHIGAN

## MOREY VERTICAL SHAPERS

Timken Taper Roller Bearings for Main Spindle  
All Others Anti-Friction



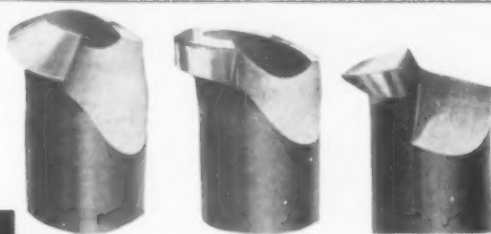
Built in two sizes  
8" stroke  
12" stroke

Accurate—simple for toolroom manufacturing. Self-contained motor drive.

Ask for Circular No. 726

**MOREY MACHINERY CO., INC.**  
410 Broome Street New York, N.Y.

MARCH, 1942



Style A—for  
general boring

Style B—for facing  
and bottoming

Style C—for  
internal threading

## TAKE A TIP *from* BOKUM

*and step up your production*

One of these tips of super high speed steel, screwed to high tempered shank of special alloy, will outlast six normally-forged tools.

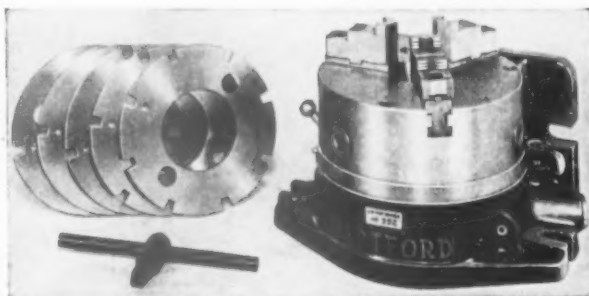
Wide range of sizes (smaller sizes in one piece). Style B specially suitable for use on turret lathes and automatics. Style C will cut wide range of different threads in smallest borings imaginable.

Also available with carbide tips

Send for Catalog No. A-1139

**BOKUM TOOL CO.,** 49 W. HANCOCK AVE.  
DETROIT, MICHIGAN

## THIS HARTFORD *"Super-Spacer"* GIVES YOU



## ACCURATE MACHINING EVEN BY *Unskilled* OPERATORS!

This Cost-Cutting tool is available to you today, when at no other time in the history of American Industry has there been greater stress on new tools which contribute to Greater, Faster or more Accurate Production! The "SUPER-SPACER", with its attachments and fixtures, is adaptable for Milling, Drilling, Grinding, Jig Boring and Slotting.

WRITE, TODAY, FOR MORE INFORMATION ON  
THIS TIME-SAVING AND ACCURATE TOOL

**THE HARTFORD SPECIAL MACHINERY CO.**  
HARTFORD, CONN.

It also contains a complete list of all sizes of kits available and over 200 accessories that may be used with the "Handee" tool.

#### (379) Welding Wires

*Eureka Tool Steel Welding Wires.* 16 pp. Welding Equipment and Supply Company, 233 Lieb Street, Detroit. This booklet explains the use of tool steel welding wires for the composite construction and repairing of tools and dies. Recommendations for applications are given, typical examples are il-

lustrated, and specifications are listed.

#### (380) Diamond Tools

*Diamonds Set In Sintered Tungsten Carbide.* 14 pp. Dia-Tool Inc., Yonkers, N. Y. The preface of this booklet gives the reasons why diamonds mounted in a matrix of sintered tungsten carbide have turned out to be such a great success. It contains details about the permanent setting of small and large diamonds as well as about resetting. It is fully illustrated and contains general operating instructions.

(Continued from page 162)

de Valera who, like St. Patrick, is of Iberian and not Hibernian stock and (am I right?) was raised in Brooklyn besides, and the guy is all het up because the Yanks landed on the wrong(?) side of the Boyne Water. Well, Eamon, it's either friendly Yanks stopping enroute to somewhere or unfriendly Nazis who'd demote you the way they did Mussolini, besides which you ain't got any guns to argue with and shelallahs ain't worth a hoot alongside o' machine guns. So, take a leaf from what you should have learned from Tammany and be glad that the fall of Denmark made you Britain's big butter and egg man. Have I got to teach you politics?

▼ ▼ ▼

Then there's Harold Ickes, honest to a fault but as short of diplomacy as a Polar day is short of daylight saving. At that, Harold, I've long since forgiven you all your faults, but why is a li'l secret I'll tell you in case you're curious. Drop me a line and I'll answer when I get time although I might give you priority. But I'm still mad at Leon Henderson, having almost sworn off coffee during the last war a/c the *ehrsatz* we had to use for sugar. Now, Leon, you quit blatting out of turn about shortages; no previews of coming events like they give us in the movies. Oh sure, I know you make alcohol from sugar (so did the bootleggers during the "Noble Experiment") and the alki makes torpedoes run. But can't you make it from maple sap that the farmers only ripen anyway a/c Uncle Sam pays 'em to keep it wet, or from weeds, of which there is an inexhaustible supply? You know, we've had a bumper crop of sugar the past year and after all there are only a hundred and thirty odd million people in the U. S. A. and you can't make me believe the pro rata consumption has jumped a declining birth rate. However, it's not the inconveniences I'm crabbing about, but the lack of sense of the thing. You'll want us to be planting gardens next spring, and we will, even if we have to work the wife to the bone to keep it weeded, us being busy elsewhere, and what the heck are the women going to use for canning? Anyway, some of the ladies will be sending you samples the way the folks are sending "bundles to Congress", and you'd better like it. Well, that's all for now, but you may "meet me in St. Louis" ... where they had a fair.

Yrs Handily

*A. B. Rylander*

THE TOOL ENGINEER

## All-Out Aid for Production

The advertisement features four images of industrial machinery arranged in a 2x2 grid. Each image is accompanied by a text label describing its capabilities:

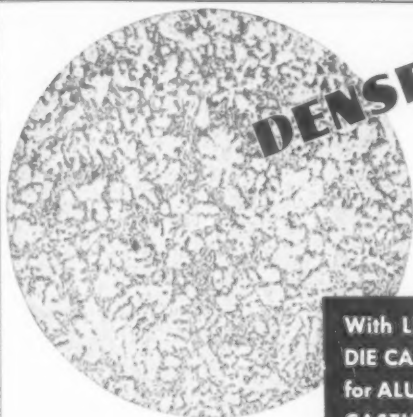
- Top Left:** A large industrial mill. Text: **RIGIDITY** for heavy milling.
- Top Right:** A precision boring machine. Text: **ACCURACY** for boring operations.
- Bottom Left:** A face mill machine. Text: **POWER** for face milling.
- Bottom Right:** A light milling machine. Text: **SPEED** for light milling.

In the center of the grid is a smaller image of a vertical lathe or similar precision machine.

WRITE TODAY FOR NEW CATALOG

**W. B. KNIGHT MACHINERY CO.**

• ST. LOUIS, MISSOURI •



**DENSER!**

Photomicrograph of No. 85 aluminum die casting, magnified 100 diameters.

With **LESTER-PHOENIX** DIE CASTING Machines for **ALUMINUM** You Get CASTINGS LIKE THIS!

You can make non-porous, homogeneous die castings of magnesium, brass, and aluminum which pass 100% X-ray inspections with *less than 1% rejections*. Lester-Phoenix Cold Chamber Machines give such results consistently in the production of incendiary bombs, airplane parts, and other items which demand density, accuracy, and soundness. You get a higher output of salable castings which approach forgings in all-around utility. Investigate Lester-Phoenix' many exclusive features today.

**LESTER  
PHOENIX**  
DIE CASTING AND  
PLASTIC EQUIPMENT

Write for your copy of Bulletin T-1,  
just off the press.

**THE PHOENIX MACHINE COMPANY**  
2711 Church Avenue • Cleveland, Ohio



**For Faster-Better  
TOOL and DIE  
Making**

**FRAY** MICROMETER  
OFFSET

**Boring Heads**

● Guesswork is eliminated and work speeded with the exclusive retainer ring design of FRAY Offset Boring Heads. This ring gives all the advantages of round construction with full strength and complete safety. Eliminates outside corners—keeps chips out of micrometer.

Standard Head is 3" Body—offsets 1 1/4". Junior head 2" Body—offsets 1/2". Each head equipped with two H.S. boring bars and three wrenches. Guaranteed satisfactory or money refunded.

Distributors—Write for complete data and territory available.

**FRAY MACHINE TOOL CO.**

505 W. WINDSOR ROAD, GLENDALE, CALIFORNIA

Makers of "All-Angle" Milling Machines & Milling Attachments

MARCH, 1942

*Keep 'em* **PST** *Going!*

**Flexoid** TOOL HOLDERS

Universal Head  
Does away with right, straight and left hand shank tool holders. No change in centers necessary when resetting cutter. Five sizes, 0 to 4.

**"ONE TOOL DOES IT ALL"**

30 Day Trial  
Is Offered

**STOCKED FOR IMMEDIATE DELIVERY**

Write or Wire Collect for Information  
Regarding Nearest Distributor.

**THE Smith POWER TRANSMISSION CO.**  
1545 E. 23rd St. CLEVELAND, O. MAin 9450

**Flexoid SPEED CONTROL UNITS • Flexoid INDUSTRIAL COUPLINGS**

**AIR CONTROLS**

*for Today*

*for Tomorrow*



When this thing is over . . . and men and nations are again at peace . . . the Ross air control valves you have installed for efficient defense production will be *equally* dependable for civilian goods production.

Ross valves installed fifteen years ago have been giving years of continuous service and now these same valves are meeting the strenuous demands of defense schedules . . . years of dependable service are engineered into every Ross Valve.

Bring your air control problems to Ross.

**ROSS Operating VALVE CO.**

6492 Epworth Boulevard

Detroit, Michigan

**ROSS**  
Air Control  
VALVES

THE BRIDLE FOR AIR HORSEPOWER



★ A SIZE AND TYPE FOR EVERY OPERATION ★

193

It also contains a complete list of all sizes of kits available and over 200 accessories that may be used with the "Handee" tool.

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Handy Andy Says

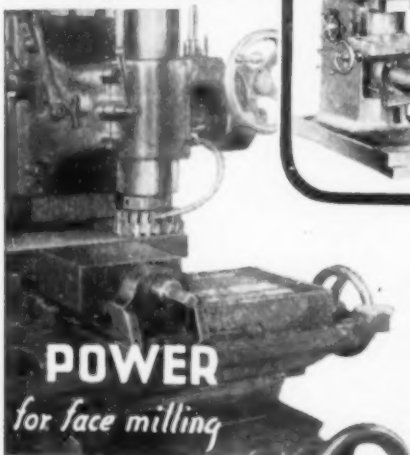
(Continued from page 162)

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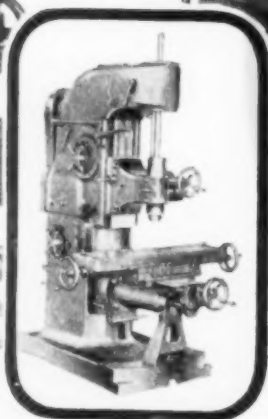
## All-Out Aid Production



**RIGIDITY**  
*for heavy milling*



**POWER**  
*for face milling*



**SPEED**  
*for light milling*

WRITE TODAY FOR NEW CATALOG

**W. B. KNIGHT MACHINERY CO.**  
• ST. LOUIS, MISSOURI •

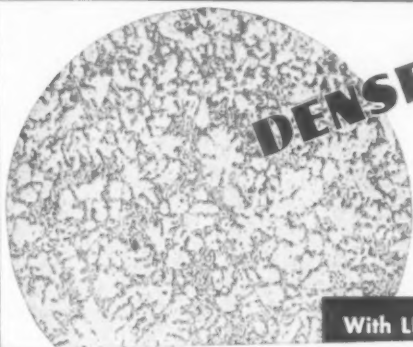
# PAG MISS

... hundred and thirty odd million people in the U. S. A. and you can't make me believe the pro rata consumption has jumped a declining birth rate. However, it's not the inconveniences I'm crabbing about, but the lack of sense of the thing. You'll want us to be planting gardens next spring, and we will, even if we have to work the wife to the bone to keep it weeded, us being busy elsewhere, and what the heck are the women going to use for canning? Anyway, some of the ladies will be sending you samples the way the folks are sending "bundles to Congress", and you'd better like it. Well, that's all for now, but you may "meet me in St. Louis" ... where they had a fair.

Yrs Handily

*A. E. Rylander*

THE TOOL ENGINEER



**DENSER!**

Photomicrograph of No. 85 aluminum die casting, magnified 100 diameters.

With LESTER-PHOENIX

# GES SING

## FRAY MICROMETER OFFSET

### Boring Heads

● Guesswork is eliminated and work speeded with the exclusive retainer ring design of FRAY Offset Boring Heads. This ring gives all the advantages of round construction with full strength and complete safety. Eliminates outside corners—keeps chips out of micrometer.

Standard Head is 3" Body—offsets 1 1/4". Junior head 2" Body—offsets 1/2". Each head equipped with two H.S. boring bars and three wrenches. Guaranteed satisfactory or money refunded.

Distributors—Write for complete data and territory available.

### FRAY MACHINE TOOL CO.

505 W. WINDSOR ROAD, GLENDALE, CALIFORNIA

Makers of "All-Angle" Milling Machines & Milling Attachments

MARCH, 1942

*Keep 'em **PST** Going!*

## Flexoid TOOL HOLDERS

**Universal Head**  
Does away with right, straight and left hand shank tool holders. No change in centers necessary when resetting cutter. Five sizes, 0 to 4.

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**HE Smith POWER TRANSMISSION CO.**  
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Flexoid SPEED CONTROL UNITS • Flexoid INDUSTRIAL COUPLINGS

## AIR CONTROLS for Today for Tomorrow

When this thing is over . . . and men and nations are again at peace . . . the Ross air control valves you have installed for efficient defense production will be equally dependable for civilian goods production.

Ross valves installed fifteen years ago have been giving years of continuous service and now these same valves are meeting the strenuous demands of defense schedules . . . years of dependable service are engineered into every Ross Valve.

Bring your air control problems to Ross.

### ROSS Operating VALVE CO.

6492 Epworth Boulevard

Detroit, Michigan



THE BRIDLE FOR AIR HORSEPOWER



★ A SIZE AND TYPE FOR EVERY OPERATION ★

# THE PASSING PARADE . . . . .

Promotions . . . Personals . . . Deaths . . .



First industrial concern in the Detroit area to purchase an ambulance for the American Red Cross, the Detroit Broach Company, in official ceremonies February 5th, presented a check for \$1,500.00 to the Red Cross for this purpose. To this donation was added cash contributions totalling \$466.40.

Check and cash were presented to

Miss Janey Briggs, adjutant of the Motor Transport Corps of the Detroit Red Cross, by Ture Lofberg, oldest employee of the firm in years of service. The donations had been made by 125 employees and the company executives.

Designed to improve coordination of carbide tool engineering and tool manufacturing in line with a further speed-

ing of war production efforts, Carboloy Company, Inc., has appointed **JAMES R. LONGWELL**, formerly Carboloy Chief engineer, to the newly created post of Factory Manager.



**JAMES R. LONGWELL**  
Carboloy's New Factory Manager

Succeeding Mr. Longwell as Chief Engineer is **PAUL H. MILLER**, who has been associated with the Carboloy engineering department for the past eight years.



**PAUL H. MILLER**  
Now Carboloy's Chief Engineer

**JAMES E. NIEDERHAUSER**, assistant to the president and director of personnel at Greenfield Tap and Die Corporation, has resigned. He plans to join Howard M. Hubbard, former president of the corporation, who is now president of the Elliott Company of Jeannette, Pa.

**GEORGE BURRER**, who has been in the personnel department, will succeed Mr. Niederhauser. He will have



Shaft

IT'S MADE OUT OF  
**SPEED CASE STEEL**  
A LOW CARBON OPEN HEARTH PRODUCT



-because . . .

It increased production 42%!

It saved \$29.64 per ton used

It reduced warpage 75%

It carburized without soft spots

Ductility  
Plus  
Machinability  
(230 SFPM)

THANK YOU! To friends both old and new . . . thanks for your patience.  
We are doing our very best for Defense . . . and also for you.

Licensor  
**MONARCH STEEL COMPANY**  
HAMMOND • INDIANAPOLIS • CHICAGO  
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MANUFACTURERS OF COLD FINISHED CARBON AND ALLOY STEEL BARS

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BORING TOOLS

FACE MILLING CUTTERS

## PRODUCTION TOOL CO.

OF AMERICA

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DETROIT, MICH.

## LOOK AT THIS CHIP!

A 2-inch diameter drill in a Universal collet chuck turning only 160 revolutions per minute cut the chip here illustrated. And during this drilling operation the drill did not slip in either a longitudinal or radial direction in the collet chuck. In addition to gripping as strong as solid steel itself, Universal chucks have ground threads and ample room for tool feed out. Write today for further facts and prices.

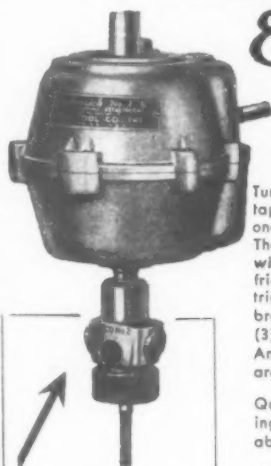


UNIVERSAL ENGINEERING CO.  
FRANKENMUTH · MICHIGAN

DO FAST, ACCURATE TAPPING  
ON YOUR DRILL PRESSES—with

*Ettco-Emrick*

### TAPPING ATTACHMENTS



#### ETTCO-EMRICK TAP CHUCKS

VISIBLE GRIP assures true centering on the round and positive driving on the square. 5 sizes for No. 0 to 1" taps. Details in BULLETIN No. 6.

Turn any drill press into a high-speed tapping machine by simply clamping one of these attachments to its spindle. The features that make possible speed with accuracy are: (1) the ingenious friction clutch design that gives hair-trigger sensitivity and prevents tap breakage; (2) the automatic reverse; (3) the tap idles in cutting direction. Another big feature—friction members are quickly replaceable as a unit.

Quill Clamps are available for mounting attachments on any drill press with absolute rigidity.

Attachments come in sizes for No. 0 to 1" taps.

**BULLETIN No. 2** gives full details and prices. Copy mailed at your request.

**ETTCO TOOL CO., INC.**  
586 Johnson Ave., Brooklyn, N. Y.  
Detroit • Chicago

MAKERS OF *Ettco-Emrick* DRILL CHUCKS • TAP CHUCKS  
MULTIPLE TAPPING AND DRILLING HEADS  
TAPPING ATTACHMENTS • TAPPING MACHINES

# SECOMET

## DIAMOND WHEELS

*Bring*

★ Better Work ★ More Economy

★ Longer Wear ★ Greater Speed

With SECOMET Diamond Wheels, cemented carbide tools are sharpened in a fraction of the time required by other wheels . . .

Tools receive a more accurate, sharper, flatter surface, and no lapping is required . . .

Tools may be reconditioned down to a minimum of tip thickness. . . Write for full details of any type of diamond wheel. No obligation.

**J. K. SMIT & SONS, INC.**  
157 Chambers Street, New York, N. Y.  
7 South Main St., Low and Finance Bldg.,  
West Hartford, Conn. Pittsburgh, Pa.  
Detroit — Chicago — Seattle

charge of the corporation's industrial relations.

**W. K. BAILEY**, sales manager of Warner and Swasey, has just been made vice-president in charge of sales and a member of the board of directors. His appointment fills the vacancy made by the death of C. S. Stilwell last November.

**MR. C. G. ROSS** has recently been appointed chief Tool Engineer for the Union Special Machine Company of Chicago. Mr. Ross is a member of the

A.S.T.E. and is director for the Chicago and South Bend Chapters.

**NOBLE B. CLARK**, manager of sub-contracting for Warner and Swasey, has been promoted to assistant sales manager. With the company for eight years, Mr. Clark was foreign sales representative in London before the war.

**RUSSELL CREIGHTON**, who has been in charge of production engineering, has been named a special assistant to Bell Aircraft Corporation Works Manager Lester L. Benson, according



**C. G. ROSS**  
Union's Chief Tool Engineer



**RUSSELL CREIGHTON**  
Promoted at Bell Aircraft



**JOSEPH B. BAUER**  
Succeeds Creighton

THE TOOL ENGINEER

## TANNEWITZ HIGH SPEED METAL CUTTING BAND SAWS

... a far Faster Means of Cutting

**TEMPLATES**

from SHEET STEEL up to 1/4"

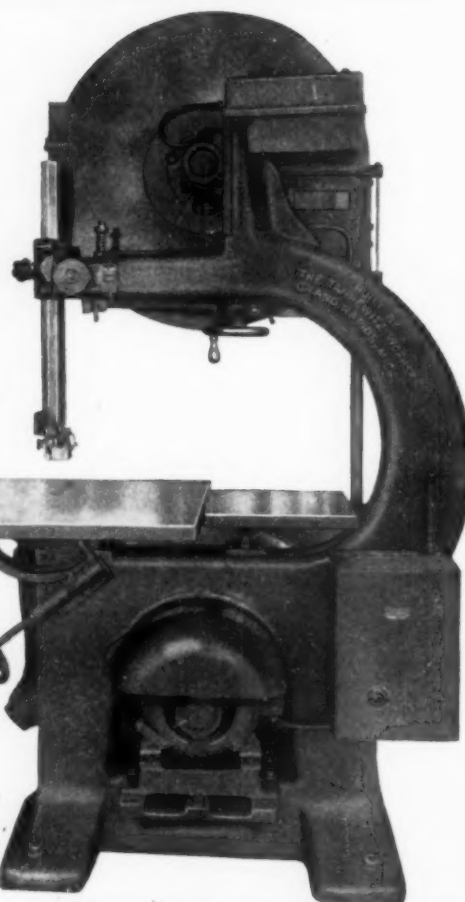
**NON-FERROUS MATERIALS**

of all kinds up to 3" thick — see chart below

### SAVE THEIR COST IN SHORT ORDER

These superb machines, delivering over two miles of saw blade travel per minute without vibration, are doing hundreds of metal cutting jobs in a fraction of the time previously required, in metal working plants of every description throughout the country. To increase production and make important savings get the details NOW! A line requesting Metal Cutting Band Saw Bulletin will bring them to you promptly.

KIND OF MATERIAL	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"
MILD STEEL	12	24	6	3	1		
STAINLESS STEEL	6	2	1				
YELLOW BRASS ZINC	24	12	6	3	1 1/2	3/4	1/2
BRONZE OR COPPER	6	3	1 1/2	3/4	3/8	1/4	1/8
ALUMINUM	24	12	6	3	1 1/2	3/4	1/2
DURALUMINUM	24	12	6	3	1 1/2	3/4	1/2
STAINLESS PLYMETAL	6	3	1 1/2	3/4	3/8	1/4	1/8
DOUBLE PLYMETAL	6	3	1 1/2	3/4	3/8	1/4	1/8
PLYWOOD	24	12	6	3	1 1/2	3/4	1/2
ASBESTOS BOARD	12	6	3	1 1/2	3/4	1/2	1/4
FIBRE (HARD)	24	12	6	3	1 1/2	3/4	1/2
PAPER BOARD	24	12	6	3	1 1/2	3/4	1/2
DIABLOITE	24	12	6	3	1 1/2	3/4	1/2
BALMITE	12	6	3	1 1/2	3/4	1/2	1/4



**PERFECTLY SAFE:** Two-wheel Lockheed Hydraulic Brakes automatically and instantly stop the wheels in case of saw blade breakage—completely guarded.

Incorporated in Tannewitz High Speed Band Saws are many highly developed, patented features found in no other band saws.

*Made by Sawing Machinery Specialists*

**THE TANNEWITZ WORKS, GRAND RAPIDS, MICH.**

## THE REID No. 2-A AUTOMATIC FEED SURFACE GRINDER

**DESIGN**—Mechanical and Hand Feeds with a reciprocating table and horizontal spindle.

**CAPACITY**—The No. 2-A Surface Grinder grinds work 18" long, 6" wide and 11½" high, using a wheel 7" in diameter.

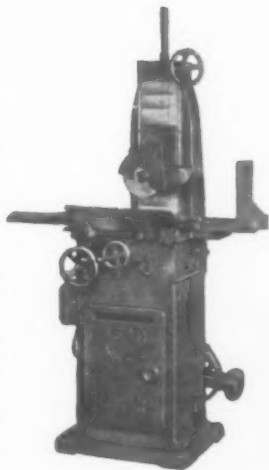
**SPINDLE**—High-grade heat-treated Chrome Molybdenum Steel; runs in phosphor-bronze boxes. Vertical adjustments are obtained by a hand wheel graduated to .0005".

**WORK TABLE**—Automatic in both directions and is controlled by dogs operating against a reverse lever.

**MOTOR DRIVE**—Machine requires a 1½ HP, 1800 RPM Motor. Motor is entirely enclosed in base of machine.

Good deliveries if priorities are attached to orders.

**FLOOR SPACE**—65"x30".



Exclusive Selling Agents

**H. LEACH MACHINERY CO.**

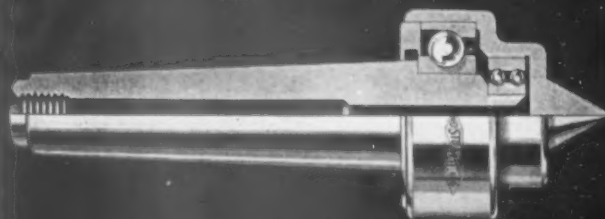
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Providence, R. I.

Send for Circular to Dept. O.  
Distributors in all leading Cities.

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ARE



AUTOMATICALLY COMPENSATED FOR  
EXPANSION, SHOCK AND WEAR  
ARE ACCURATE, DURABLE

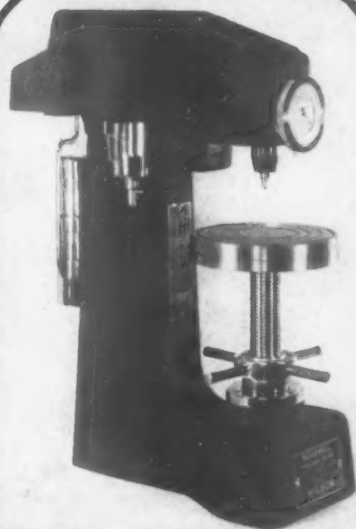
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## "ROCKWELL" HARDNESS TESTER



All our wits, experience and  
equipment we devote solely  
to these testers.

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MECHANICAL INSTRUMENT CO. INC.  
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## FASTER FINISHING OPERATIONS WITH **SCHAUER** —SPEED—LATHES—

For POLISHING — LAP-  
PING — and BURRING of  
gears . . . pinions . . . screw  
machine parts . . . and all  
other similar products. With  
hand or foot-operated  
mechanism, completely  
automatic air operated,  
variable spindle speeds,  
vacuum holding fixtures—  
all types of standard speed  
lathes for secondary opera-  
tions. Speed Lathes to meet  
your special or individual  
requirements will be de-  
signed by our Engineering  
Department.



Write for Catalog  
No. 420

TYPE VA3B VARIABLE SPEED LATHE.  
Designed for lapping gages at low speeds.

"the originator of today's Speed Lathes"

**SCHAUER MACHINE COMPANY**

2066 READING ROAD

CINCINNATI, OHIO

to a company announcement. Succeeding Creighton in charge of production engineering is **JOSEPH B. BAUER**. At the same time, **HARRY W. ASHBURN**, previously in charge of tool design, was appointed chief planning engineer, and **HAROLD L. SMELTZER**, formerly in the tool design section, succeeded Mr. Ashburn.

**Died**

**FRANK R. SCHUBERT**, an internationally-known industrial engineer, died at his home in Tonawanda, N. Y. fol-

lowing a heart attack on the morning of February 4. Mr. Schubert, who was 47, has been with the Houde Engineering Corporation since 1936 and at the time of his death was assistant general manager of the company. He gained prominence while in Russia nearly 12 years ago where he served in the capacity of consulting engineer and works manager for the first State Anti-Friction Bearing Plant in Moscow. Mr. Schubert was a graduate of the Case School of Applied Science, and served in the

first World War. He was a member of the Buffalo Chapter of the A.S.T.E.

**MR. A. N. LINDBERG**, president of the Lindberg Engineering Company and the Lindberg Steel Treating Company, Chicago, died on February 2. He was born at Narke, Sweden and came to the United States in 1893. In 1921 Mr. Lindberg formed his steel treating company and in 1935 with F. A. Hansen and C. H. Stevenson formed the Lindberg Engineering Company.



**A. N. LINDBERG**  
Steel treater dies.

**WILLIAM W. GORDON**, 75, well known manufacturer died recently in his home at Hazardville, Conn. after a week's illness. Mr. Gordon was a partner in the Gordon and Gordon mill and vice president of the Gordon Brothers mill in Scitico, Conn. and a director of the Assawaga Woolen Company in Danville, Conn.

**CHARLES T. PLUNKETT JR.**, 55, a director of the Berkshire Fine Spinning Associates, Inc. and former president of the W. C. Plunkett & Sons Co. died recently in Rio de Janeiro.

**FRANK DOWD COMERFORD**, 48, president of the Boston Edison Co. died in New England Baptist Hospital, Boston recently. Men high in the utility field, distinguished alumni of Holy Cross, state and national officials, including Governor Saltonstall, a Harvard Law School classmate and United States Senator, David I. Walsh were among those at the funeral.

**JOHN L. SAXE**, 53, engineer of the Stevens Arms Company, Springfield, Mass. died recently.

**WILLIAM FERGUSON**, 56, widely known as a textile sales engineer for the Whitin Machine Works Whitinsville, Mass. died after a several weeks' illness. Mr. Ferguson served the Whitin concern for nearly 40 years. He supervised the erecting of machinery in Germany, France and other European countries. His last trip was to Scotland.

**Eliminate Grinding - Polishing - Lapping!**

**CUT and FINISH  
in ONE Operation  
with  
ASCO  
DIAMOND  
TOOLS**

The use of "Asco" Diamond Cutting Tools for fine turning, boring, tapping and finishing operations, produces a mirror-like surface, that, in most cases, eliminates need for subsequent grinding, polishing and lapping. This saving of an entire operation is a vital consideration in meeting the rush demands of War production.

But that's not all! "Asco" Diamond Cutting Tools permit cutting at much higher speeds—cut to closer tolerances—maintain their precision cutting for much longer periods on toughest metals, alloys and compositions.

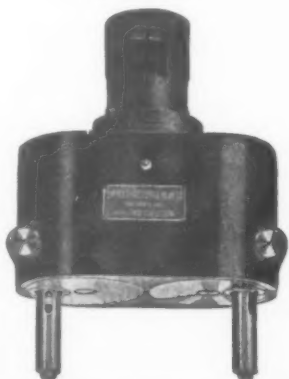
"Asco" Diamond Cutting Tools are shaped to your specifications, with Diamonds expertly selected and set to meet the exact needs of the operation and material to be machined. "Asco" Tools are backed by over 30 years' specialized experience in industrial diamonds.

Send blueprints of your tool requirements for quotation. Prompt shipment can be made. Ask for illustrated folder showing many industrial uses of diamonds.

DRESSING TOOLS • WIRE DRAWING DIES • CORE BITS • PHONO POINTS • WRITING PENCILS  
VALVE REFACERS • IMPREGNATED DRESSERS • DIAMOND CHARGED SAW BLADES • GLAZIERS' TOOLS

**ANTON SMIT & CO., INC.**  
LEONARD J. A. SMIT, Managing Director  
333 WEST 52nd STREET - - - NEW YORK, N. Y.  
TELEPHONE: COLUMBUS 5-5395  
IMPORTERS OF INDUSTRIAL DIAMONDS—BORTZ, CARBONS AND BALLAS.  
MANUFACTURERS OF ALL KINDS OF DIAMOND TOOLS.

# U S HEADS STANDARD SINCE 1915



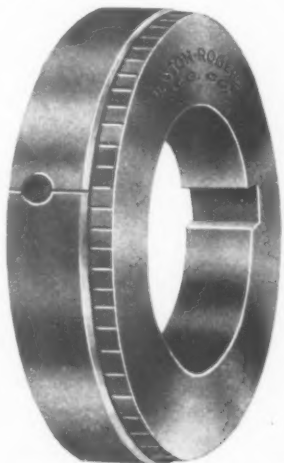
30 DIFFERENT STANDARD SIZE  
ADJUSTABLE DRILL HEADS,  
CAPACITIES UP TO 1 1/2" DRILLS

SEND US YOUR B/P'S

All Types of Fixed Center Heads

UNITED STATES DRILL HEAD CO.  
Cincinnati, Ohio

## ADJUSTABLE SPACING COLLAR for PRODUCTION MILLING



Don't overlook this very important factor to assure better and quicker results for accurately spacing of all side milling cutters, gang milling, and various other multiple milling machine setups.

These new precision adjustable spacing collars for milling machine cutter arbors lend themselves for spacing quickly and accurately all production milling operations. These adjustable collars fit all milling machine cutter arbors and are graduated in thousandths, having maximum adjustment of 1/16", assuring precision and positive spacing adjustment at all times.

See your nearest jobber or write for details.

DAYTON ROGERS MFG. CO.  
Minneapolis, Minn.

MARCH, 1942



## ORIGINATORS

and exclusive manu-  
factures of DUBLIFE  
GAGES and UPPCO  
FINISH

UNITED PRECISION PRODUCTS CO.  
4617 W. HURON ST., CHICAGO, ILL.



**DUBLIFE**  
PLUG GAGES LAST TWICE AS LONG  
AS ORDINARY GAGES

**"UPPCO FINISH"**  
ASSURES EXTREME HARDNESS  
AND ACCURACY

The handle is made of hexagon material with bronze tapered collet which locks around the plug as it is driven into the handle. The plugs are reversible, so that when one end is worn out the other end may be used, thus giving double life. 30,000 gages in stock ranging from .030" to 1".

Catalog showing DUBLIFE and other gages of American Gage design will be sent on request.

**FASTER  
CHEAPER  
ROUGH  
GRINDING**

WITH

**MARSCHKES**



Maximum life for the expensive abrasive wheels used in snagging and rough grinding operations can be attained only with smooth running wheels turning at correct speeds during all stages of wheel life. This depends upon good machines. The eighteen features of Marschke Grinders—including inflexible spindles and controlled speeds—guarantee superb efficiency to users. Marschkes are unequalled for dependable durability, stand up under toughest, dirtiest working conditions. Marschke Swing Frame and Floor Stand Grinders are the economical machines for all heavy duty rough grinding operations.

## THE MARSCHKE LINE

Over 70 specifications of Swing Frame, Floor Stand and Pedestal Grinders — and Buffers—1 to 25 HP, 10" to 30" wheels. Write for Marschke catalog, to

VONNEGUT MOULDER  
CORP., 1820 Madison Ave.  
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C-F POSITIONERS FOR PRODUCTION WELDING

VERTICAL

HORIZONTAL

(ABOVE 45°)

HAND

ALL "DOWN-HAND"

● Investigate this fast, economical and safe way of welding fabrication by asking for our booklet WP 20, gladly sent upon request.

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USE THIS **INSPECTOGRAPH**  
FOR FINE AND ACCURATE WORK  
FOR INSPECTION OF FINISHED PARTS

Today, more than ever before, contracts call for top accuracy. Let the INSPECTOGRAPH solve this problem for you! Regardless of the type of overhead lighting used in modern shops, it is impossible to eliminate shadows and glare. And here's where the INSPECTOGRAPH enters the picture—it has a soft, diffused fluorescent light, so inclosed as to be concentrated solely on the object, and a large lens to speed up inspection. It is 11½ inches wide, 12 inches high, 10 inches deep and has a lens diameter of 4 inches. Can be supplied in two models. Fully Guaranteed—Sold on 10 Days' Free Trial.

Model A (Single Bulb) Net Price, \$22.40

Model B (Double Bulb) Net Price, \$26.40

**SCHULTZ & ANDERSON CO.**  
MACHINE TOOLS  
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## BALDOR BALL BEARING GRINDERS

for accurately sharpening  
**CARBIDE TOOLS**



1-YEAR GUARANTEE

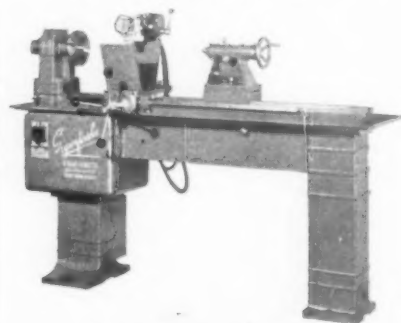
BALDOR CARBIDE TOOL GRINDER is precision-built for accurately and quickly sharpening Carbide Tools. Sturdy ½ H.P. heavy duty, ball-bearing, reversible Motor. Large adjustable tool-rest tables. Satisfaction guaranteed.

**NEW LOW PRICE \$95.00**

WRITE FOR BULLETIN 305  
BALDOR ELECTRIC COMPANY  
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BUILT BY MOTOR SPECIALISTS

OHIO UNITS  
*Superfinisher*  
LICENSED BY CHRYSLER



**CARTRIDGE CASE  
DIES & PUNCHES**  
are being  
**SUPERFINISHED**  
for longer life

In hundreds of DEFENSE JOBS from heavy tanks and aeroplanes, to small delicate precision parts, these machines are really doing the FINISHING... Internal... external... flats... rounds... tapers.

OHIO UNITS, MANUFACTURERS  
DAYTON, OHIO

THE TOOL ENGINEER



That's a standard file shown above—and a Hardsteel drill is drilling it! Hardsteel drills cut such steels simply and easily, without annealing, without special equipment... and leave a smooth burnished surface in the hole. Let us show you how to drill hardened steel of any analysis and any hardness.

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Chicago Rawhide Mallets and Hammers are the best tools you can buy for protecting surfaces when they need to be pounded.

Genuine Java Water Buffalo Hide will not split, crack or break. The hydraulically compressed heads of Chicago Rawhide Mallets and Hammers are safe to use and safe to handle. Hammers have replaceable faces in malleable iron heads. These economical tools are made in sizes and weights for every purpose. You can get them through your dealer.

The next time you buy, ask for Chicago Rawhide tools.



**CHICAGO Rawhide MFG. CO.**  
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MARCH, 1942

**MAGNETIC CHUCK USERS SAVE MONEY  
WITH**

**NEUTROL**

**NEW BULLETIN NO. 21**

Gives Full Information



Neutrol provides quick release of the work piece from the chuck—demagnetizes the work as it releases it. Neutrol eliminates "hammer and pry". Just turn the power "Off" and you can pick up the work piece in a few seconds. Neutrol eliminates waste time—saves the chuck—eliminates injury to the operator. Neutrol can be easily installed on grinding machines now in operation—or on new grinders by grinding machine manufacturers.

Two types: Motor Controlled for Remote Control—and Manual Controlled for small units. "There's a Neutrol for every size of chuck."

Write for Complete Information

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**DIA-TOOL INC.**

**DIA-TOOL INC.**

**DIAMONDS**  
SET IN SINTERED TUNGSTEN CARBIDE

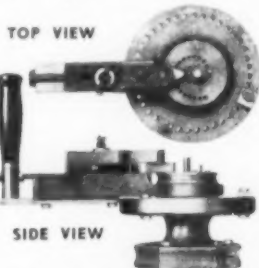
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320 YONKERS AVENUE, YONKERS, N. Y.

## METAL DUPLICATING

### Without Dies

The DI-ACRO System of "Metal Duplicating Without Dies" enables you to produce a great variety of metal parts to Die accuracy, without the Time Loss or Expense of Dies and Die Sets. DI-ACRO Precision Machines—Bender, Brake, Shear—make this possible.



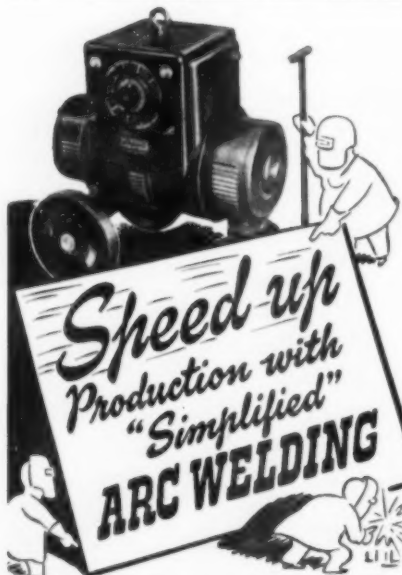
DI-ACRO BENDER NO. 1

Accurately forms or bends to intricate shapes many materials—such as Angles—Channel—Rod—Round or Square Tube—Round, Half-Round, Square or Flat Wire, Strip Stock, etc. Two-way operation, right or left.

Get the whole story—write for Catalog—*"Metal Duplicating Without Dies"*

O'NEIL - IRWIN MFG. CO.

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● The most valuable tool in industry today! Exclusive features of Hobart "Simplified" Arc Welders let you speed up production while increasing quality of the welds. Each welder withstands hours and hours of continuous welding, yet remains cool and efficient. They're easy to operate and get lower current costs. Write today for details.

#### Valuable New Welding MANUAL

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one of the world's Largest Builders of Arc welders

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are used on—

- GEAR SHAPERS
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PRICE WITH ONE  
PUNCH AND ONE  
DIE—

**\$50.00**

Immediate  
Shipment

Built for hard tough work — die cannot lose alignment with punch — all parts interchangeable.

Capacity 1/2" holes through 1/8" steel; 3/8" through 1/4" steel. Can also be made for holes up to 3/8" in thinner metal. Stock punches and dies available from 1/8" to 1/2" by 64ths.

Weight, 70 lbs.

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MACHINE CO.**

(Est. 1890)

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### EVEREDE TWO-STEP BAR



The ONLY Boring Bar with the economical triangular bit.

Designed to use a larger bar diameter as the bit cuts ahead of the bar. This insures rigidity, making higher boring speeds and heavier cuts possible.

Everede Boring Bars are made of the finest heat treated nickel steel and each bar is furnished with six triangular high speed steel bits.

The Everede Boring Bar also permits the use of a solid stellite or carbide tool bit by clamping the bit in the "V" Type grip holding it firmly without danger of breakage.

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Monroe 2345

Every pound of tungsten saved, is a pound gained. More than that—

Every H.S. Cutter, Drill, or Reamer reconditioned is a tool gained, and maybe that comes closer to home for you.

Are you helping?

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Cleveland,  $\frac{7}{8}$  &  $1\frac{1}{4}$ " Model B  
Cleveland,  $\frac{3}{8}$ ,  $\frac{1}{2}$  &  $1\frac{1}{4}$ " Model A  
 $2\frac{1}{4}$ ,  $3\frac{1}{4}$  and  $4\frac{1}{4}$ " Gridley single spindle  
No. 22 new Britain

### BORING MILLS & DRILLS

42" Bullard, 2 Swivel Heads  
54" Niles, 2 Swivel Heads  
Morris, 4" Radial, M.D.

### GRINDERS

Brown & Sharpe 3 Universal  
10" x 36" Landis, Self Contained  
Norton, 10 x 24 & 36" Plain,  
Lapper, No. 15 Norton M. D.

### LATHES

Hendley Yoke Head, 18" x 10' Taper Attcht.  
Davis 20" x 10' M. D.  
3" x 36" Jones & Lamson Flat Turret

### MILLING MACHINES

No. 4 B Becker Vertical  
Cincinnati No. 3 Universal Rockford No. 2 B Universal

### PRESSES

Nos. 34 & 35 Toledo Solid Back, Geared  
No. 2, 3, 4 Farracute Solid Back  
No. 68 N Bliss, Dble. Action, Cam

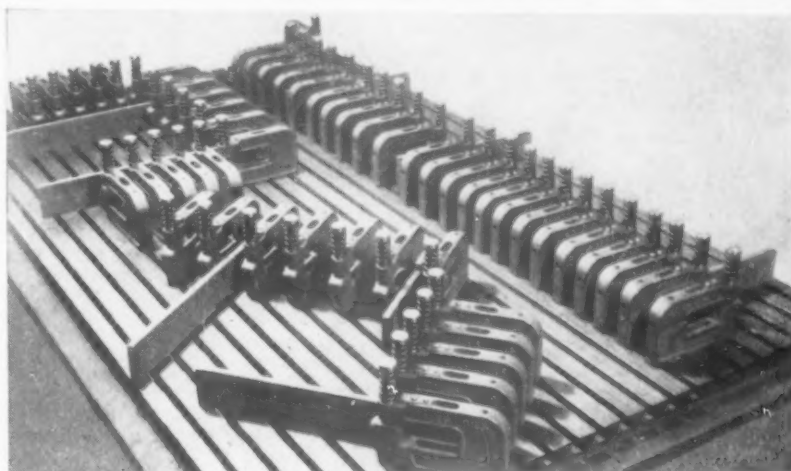
Planers, Shapers, Shears, Etc.

MACHINE TOOLS POWER PRESSES



546 Second Ave. Detroit, Mich.

MARCH, 1942



Showing 3 patterns of Wales Hole Punching Dies on one T-slotted plate. The versatility of these self-contained punch and die holders provides "patterns unlimited."

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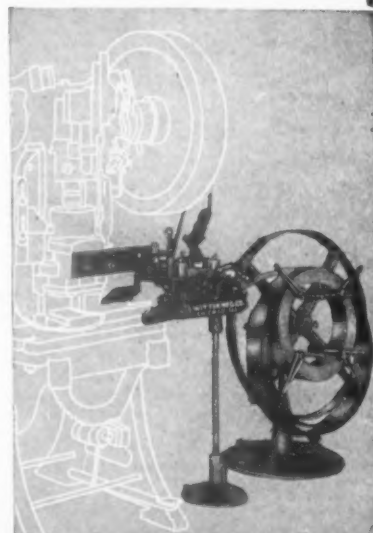
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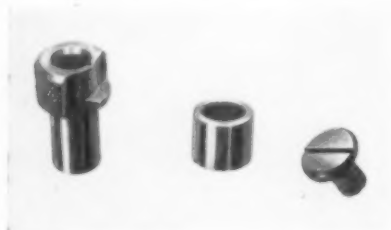
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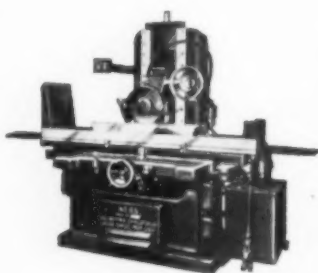
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## MARCH MEETINGS

**DETROIT**—March 12. Dinner at 6:30 P.M. Hyler's Concourse Dining Room in the Fisher Building. The technical session will be at 8 P.M. The two speakers for the program will be Dr. John J. Caton, Director of the Chrysler Institute of Engineering, who will speak on "We Won't Face the Facts", and Captain Don Leonard, Office of Civilian Defense, who will speak on "Civilian Defense".

**HARTFORD**—April 6. 8 P.M. Hartford Gas Company Auditorium. The speaker will be Mr. A. H. d'Arcambal, Sales Manager and consulting engineer of the Pratt and Whitney Division, who will talk on "Machineability of Metals". Reservations: Henry A. Rockwell, Hamilton Standard Propeller Division.

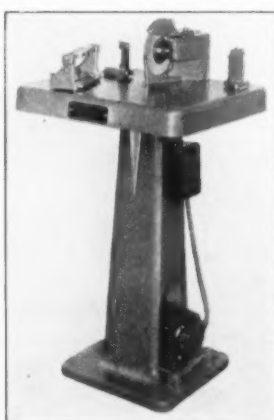
**NEWARK**—March 10. Hotel Robert Treat. The speaker of the evening will be Mr. Herman Goldberg who will talk on the subject of taps and tapping machines.

**PHILADELPHIA**—March 20. 6:30 P.M. Engineers Club. The evening's program will consist of a motion picture on the Ford Rouge Plant of the Ford Motor Company and the installation of newly elected officers.

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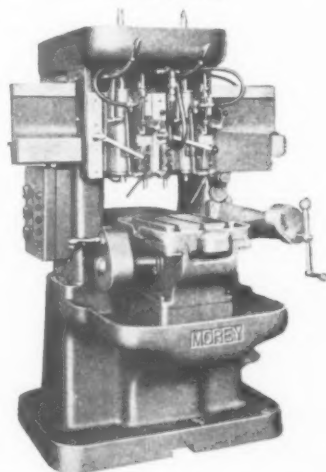
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**ROCHESTER** — March 11. 8 P.M. Hotel Sagamore. W. R. Fisher will be the sponsor. A motion picture will be shown entitled, "Canadian Rockies—the North West".

**ST. LOUIS** — March 12. 6:30 P.M. Melbourne Hotel. The speaker will be Mr. H. E. Linsley who will have as his subject, "Mass Production In the Aircraft Engine Industry".

**SOUTH BEND** — March 10. 7 P.M. Indiana Club. The speaker will be Otto W. Winter, first vice-president of the A.S.T.E., who will speak on "Russia's Background For the Present Crisis". Also on the program will be hunting pictures shown by Mr. W. R. Fisher of the Universal Engineering Company. Reservations: Glave S. Bunch.

**SYRACUSE** — March 10. Onandaga Hotel. Mr. F. T. Ellis, engineer of the Heald Machine Company, will give an illustrated lecture on precision finishing of surfaces.

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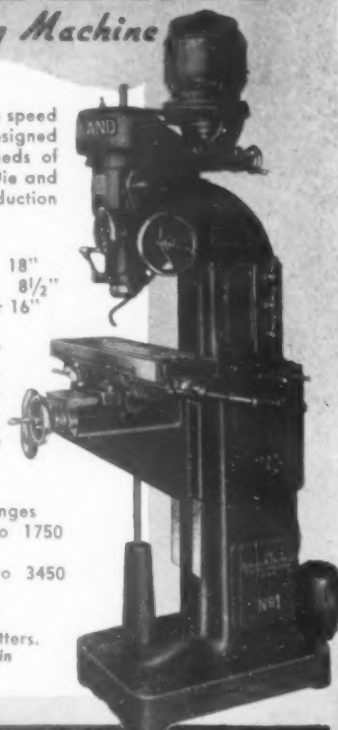
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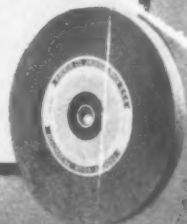
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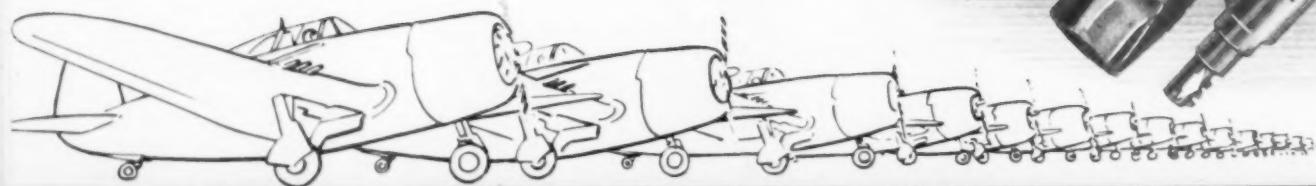
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